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ACQUISITION OF THE BATTLEFIELD COMBAT
IDENTIFICATION SYSTEM

Report No. D-2001-093   March 30, 2001

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Abstract
The Battlefield Combat Identification System (BCIS), an Army Acquisition Category II program, is a secure question and answer system that performs active identification of friendly targets to minimize fratricide on the battlefield. The Army initiated the program to correct battlefield combat identification deficiencies following Operation Desert Storm. The Army has primarily focused the BCIS on ground-to-ground vehicle, friend or foe identification and plans to procure 1,169 BCIS units to equip multiple vehicles in the 4th Infantry Division. The Army procurement objective is 16,414 BCIS units at an estimated life-cycle cost of $918.5 million through FY 2025 in FY 1999 dollars.

Subject Terms

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Acronyms

ACAT	Acquisition Category
BCIS	Battlefield Combat Identification System
C^4I	Command, Control, Communications, Computers, and Intelligence
ORD	Operational Requirements Document
TEMP	Test and Evaluation Master Plan
TRADOC	Training and Doctrine Command (Army)

March 30, 2001

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION,
TECHNOLOGY, AND LOGISTICS
DIRECTOR, OPERATIONAL TEST AND EVALUATION
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on the Acquisition of the Battlefield Combat Identification
System (Report No. D-2001-093)

We are providing this report for review and to obtain comments and a statement of actions to be taken. This report discusses the readiness of the Battlefield Combat Identification System to enter full-rate production. We considered comments from the Acting Director, Operational Test and Evaluation, and the Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) when preparing the final report.

DoD Directive 7650.3 requires that all recommendations be resolved promptly. The Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) comments were unresponsive on Recommendation A. Therefore, we are redirecting the recommendation to the Under Secretary of Defense for Acquisition, Technology, and Logistics and request that the Under Secretary provide comments on the recommendation by May 30, 2001.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) (jmeling@dodig.osd.mil) or Mr. Jack D. Snider at (703) 604-9087 (DSN 664-9087) (jsnider@dodig.osd.mil). See Appendix F for report distribution. The audit team members are listed inside the back cover.

Thomas F. Gimble
Acting
Deputy Assistant Inspector General
for Auditing

Report No. D-2001-093   **March 30, 2001**
    (Project No. D2000AE-0210)

Acquisition of the Battlefield Combat Identification System

Executive Summary

Introduction. The Battlefield Combat Identification System (BCIS), an Army Acquisition Category II program, is a secure question and answer system that performs active identification of friendly targets to minimize fratricide on the battlefield. The Army initiated the program to correct battlefield combat identification deficiencies following Operation Desert Storm. The Army has primarily focused the BCIS on ground-to-ground vehicle, friend or foe identification and plans to procure 1,169 BCIS units to equip multiple vehicles in the 4th Infantry Division. The Army procurement objective is 16,414 BCIS units at an estimated life-cycle cost of $918.5 million through FY 2025 in FY 1999 dollars.

Objectives. The primary audit objective was to evaluate the overall management of the BCIS. Because the BCIS was in the engineering and manufacturing development phase, we evaluated whether management was cost effective in readying the system for the production phase of the acquisition process. We also evaluated the management control program as it related to the audit objectives.

Results. The BCIS acquisition strategy and test and evaluation master plan warranted management attention as indicated in the following paragraphs.

- The Army did not have a viable acquisition strategy to acquire the BCIS at the completion of the engineering and manufacturing development phase of the acquisition process. As a result, the Army obligated about $132.4 million in research, development, test and evaluation, and procurement funds through FY 2000 and plans to obligate another $86.5 million to complete development efforts and produce 1,169 low-rate initial production units from FY 2001 through FY 2007 for the 4th Infantry Division. However, the Army had not provided $918.5 million of procurement and operations and maintenance funds for the BCIS procurement objective. Implementing the recommendation to not allow the third phase of the low-rate initial production unless the Army provides full funding for BCIS production would permit the Army to put $86.5 million of remaining funds to better use should the Army determine that the program is unaffordable (finding A).

- The BCIS did not have an up-to-date and comprehensive test and evaluation master plan. Further, the Army lacked funding to test 19 operational requirements and did not plan to operationally test a production prototype of the system in cold, fog, snow, or rain. Without an updated test and evaluation master plan that accurately shows user requirements, testers will not fully evaluate the effectiveness of the BCIS in reducing fratricide. As a result, the Army has increased the risk of producing a system that will not meet the full needs of the user. Also, the milestone decision authority will not have sufficient operational test data to assess the readiness of the BCIS to enter full-rate production (finding B).

The management control program for the BCIS did not ensure that Army management periodically reviewed program documents, such as the operational requirements document and the test and evaluation master plan, to determine whether the documents were up-to-date and in compliance with Army guidance (Appendix A).

Summary of Recommendations. We recommend that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) not allow the BCIS to continue with the third phase of low-rate initial production until the Army provides full funding for the production phase of the program and determines that the program is affordable. Further, we recommend that the Army Training and Doctrine Command System Manager update and correct identified deficiencies in the BCIS Operational Requirements Document and that the Director, Operational Test and Evaluation, designate the BCIS for oversight. We also recommend that the Product Manager, Combat Identification, update the BCIS Test and Evaluation Master Plan and delay the in-process review until the Army completes its operational testing.

Management Comments. We received comments from the Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (the Deputy); the Acting Director, Operational Test and Evaluation; and the Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space) (the Deputy Assistant), Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence). The Deputy nonconcurred with finding A and the associated recommendation to not allow the BCIS to continue with the third phase of low-rate initial production until the Army provides full funding. The Deputy also nonconcurred with delaying the in-process review scheduled for January 2001 until the Army completes its operational testing. However, the Deputy concurred with finding B and implied that he concurred with the recommendations to update and correct identified deficiencies in the BCIS Operational Requirements Document and to update the BCIS Test and Evaluation Master Plan, even though he did not specifically address those recommendations in his comments. The Deputy also provided comments and recommended changes to selected statements in the report. The Acting Director concurred with the recommendation to designate the BCIS for oversight, which he did in November 2000. Although not required to comment, the Acting Director concurred with the recommendations addressing the comprehensive test planning strategy (finding B) and the Deputy Assistant concurred with all the recommendations in the report except the recommendation to delay the in-process review scheduled for January 2001 because the Army completed the in-process review and approved the third phase of BCIS low-rate initial production. A discussion of the management comments is in the Finding section of the report, and the complete text is in the Management Comments section.

Audit Response. Because the Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) approved the BCIS entering into the third phase of low-rate initial production to procure an additional 1,032 BCIS units, costing about $43.3 million, without full funding for the program and without determining whether the program was affordable and fully met the needs of the user to reduce fratricide, we are redirecting the recommendation to the Under Secretary of Defense for Acquisition, Technology, and Logistics to ensure that the Army spends funds on efforts that it is committed to fully funding and that are affordable. Therefore, we request that the Under Secretary of Defense for Acquisition, Technology, and Logistics provide comments by May 30, 2001.

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Battlefield Combat Identification System (Source: Office of the Product Manager, Combat Identification)

Background

During Operation Desert Storm, the Army experienced 28 fratricide incidents that resulted in 35 killed in action and 72 wounded in action. Of those incidents, 61 percent resulted from ground-to-ground engagements. The Army initiated the Battlefield Combat Identification System (BCIS), an Army Acquisition Category II program, in April 1993, to correct battlefield combat identification deficiencies following Operation Desert Storm. The BCIS is a secure question and answer system that performs active identification of friendly targets to minimize fratricide on the battlefield. The BCIS goal is to reduce the risk of fratricide by identifying BCIS-equipped targets under all battlefield conditions, including degraded environmental conditions, such as smoke, darkness, rain, dust and fog. The Army plans to equip "shooter" platforms, such as tanks and other fighting vehicles, with BCIS units to determine whether suspect platforms are friend or unknown[1] and provide the same information to other shooters. When the shooter activates the shooter platform's laser range finder or interrogation button, the action automatically triggers the BCIS interrogation, which sends an encrypted, directional query message to the targeted vehicle. If the targeted vehicle is friendly and equipped with BCIS, its transponder answers with an encrypted, omni-directional friend message. If the BCIS calculated distance to the target is approximately the same as the distance estimated by the laser range finder, then a friend light illuminates in the gunner's sight, supplemented by voice confirmation. If the BCIS-calculated distance is substantially different from the laser range finder-calculated distance, then BCIS gives the shooter friend-at-range visual and audio signals, indicating that a friend is at the range calculated by BCIS, but may not be the target in the gunner's sight. If the shooter receives an improperly encrypted answer or no answer, it interprets the action as an unknown response and continues to engage. The Army also plans to equip select nonshooter platforms such as high mobility multi-purpose wheeled vehicles and armored personnel carriers with BCIS transponder units. TRW Incorporated is the prime contractor for the BCIS. Appendix B provides definitions of technical terms used in this report.

The Army assigned overall BCIS management to the Program Executive Office, Intelligence, Electronic Warfare, and Sensors. The Product Manager, Combat Identification, is responsible for day-to-day management of the program and is the materiel developer for the BCIS, with overall responsibility for development, test, production, integration, and deployment of the system. The Army Acquisition Executive[2] is the milestone decision authority for the BCIS. The Army Training and Doctrine Command (TRADOC) System Manager represents the user and defined the BCIS operational requirements. The Army has primarily focused the BCIS on ground-to-ground vehicle, friend or unknown identification and plans to procure 1,169 BCIS units to equip multiple vehicles in the 4th Infantry Division at Fort Hood, Texas. The Army projects the life-cycle cost for the 1,169 BCIS units through FY 2025 to be about $129.5 million

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[1]According to the Product Manager, Combat Identification, BCIS does not positively identify foe platforms.

[2]The Army Acquisition Executive is the Assistant Secretary of the Army (Acquisition, Logistics, and Technology).

in FY 1999 dollars. The Army procurement objective is 16,414 units, which represents fielding BCIS to the Active Components and training bases with a projected life-cycle cost of about $918.5 million. The Army acquisition objective is 43,762 units to field the BCIS to the Active Components, National Guard, Army Reserve, and training bases.

Objectives

The primary audit objective was to evaluate the overall management of the BCIS. Because the BCIS was in the engineering and manufacturing development phase, we evaluated whether management was cost effective in readying the system for the production phase of the acquisition process. We also evaluated the management control program as it related to the audit objectives. See Appendix A for a discussion of the audit scope and methodology, the review of the management control program, and prior coverage related to the audit objectives.

A. Viable Acquisition Strategy

The Army did not have a viable acquisition strategy to acquire the BCIS at the completion of the engineering and manufacturing development phase of the acquisition process. This condition occurred because the milestone decision authority allowed the BCIS to enter low-rate initial production without determining whether the program was affordable and without ensuring that the Army had fully funded the program. As a result, the Army obligated about $132.4 million in research, development, test and evaluation, and procurement funds through FY 2000 and plans to obligate another $86.5 million to complete development efforts and produce 1,169 low-rate initial production units from FY 2001 through FY 2007 for the 4th Infantry Division. However, the Army had not provided $918.5 million of procurement and operations and maintenance funds to acquire and support the BCIS procurement objective of 16,414 units.

Full-Funding and Acquisition Strategy Policy

Full-Funding Policy. DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," Change 4, May 11, 1999;[3] Army Regulation 70-1, "Research, Development, and Acquisition, Army Acquisition Policy," January 15, 1998; and Army Pamphlet 70-3, "Research, Development, and Acquisition -- Army Acquisition Procedures," July 15, 1999, define requirements for full funding of acquisition programs at program initiation.

DoD Regulation. DoD Regulation 5000.2-R requires the milestone decision authority to assess affordability at each milestone decision point beginning with program initiation. Further, the Regulation requires that the milestone decision authority not approve an acquisition program to proceed beyond program initiation unless sufficient resources, including manpower, are programmed in the most recently approved Future Years Defense Program, or will be programmed in the next Program Objectives Memorandum, Budget Estimate Submission, or President's Budget.

Army Regulation. Army Regulation 70-1 requires the Army to follow guidance and procedures contained in DoD Regulation 5000.2-R for Acquisition Categories II through IV programs.

Army Pamphlet. Army Pamphlet 70-3 supplements DoD Regulation 5000.2-R and requires that full funding, which is the total cost for developing, procuring, and sustaining an acquisition program, be shown in the most recent Future Years Defense Program for all programs, regardless of acquisition category.

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[3]DoD initially issued DoD Regulation 5000.2-R on March 15, 1996, which included the full-funding guidance and acquisition strategy guidance, discussed later.

Acquisition Strategy Policy. DoD Regulation 5000.2-R requires the program manager to develop and document an acquisition strategy that will serve as the roadmap for program execution from program initiation through post-production support and includes the critical events that govern the management of the program. The primary goal of the acquisition strategy is to minimize the time and cost of satisfying an identified, validated need consistent with common sense and sound business practices.

Low-Rate Initial Production. DoD Regulation 5000.2-R states that low-rate initial production quantities for all acquisition categories should be minimized. Further, the Regulation states that the purpose of low-rate initial production is to produce the minimum quantity necessary to provide production configured or representative articles for operational tests; establish an initial production base for the system; and permit an orderly increase in the production rate for the system, sufficient to lead to full-rate production upon successful completion of operational testing.

Engineering and Manufacturing Development Phase Continues Without Procurement Funds

The Army did not have a viable acquisition strategy to acquire the BCIS. This condition occurred because the milestone decision authority allowed the BCIS to enter low-rate initial production without determining whether the program was affordable and without ensuring that the Army had fully funded the program.

During the engineering and manufacturing development milestone decision in July 1993, the Army Acquisition Executive approved the "Acquisition Strategy Report for the Battlefield Combat Identification System (BCIS)," that focused on the development, procurement, and integration of a near-term system.[4] The BCIS Acquisition Strategy covered the program structure and acquisition approach. In addition, the Army Acquisition Executive approved a low-rate initial production quantity of 1,660 units contingent on whether such a quantity was necessary to support an initial production base for the system, and permit an orderly increase in the production rate for the system, sufficient to lead to full-rate production. On June 4, 1999, after conducting an affordability analysis of the BCIS for the low-rate initial production decision, the Deputy Director, Army Program Analysis and Evaluation Directorate, stated that BCIS was unaffordable for low-rate initial production and that he could not support incremental funding of the BCIS for only the 4th Infantry Division. The Deputy Director advised the Army Systems Acquisition Review Council (the Council) that the BCIS had a funding shortfall of $2 million for procurement of the low-rate initial production units from FY 2000 through FY 2002 and a shortfall of $183 million for full-rate production from FY 2000 through FY 2005. Further, the Deputy Director stated that the BCIS had a funding shortfall of $3.7 million from FY 2002 through FY 2005 for operations and maintenance,

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[4]The near-term system is a nonpermanent, easily attached and removed BCIS unit that provides positive target identification for ground-to-ground and air-to-ground engagements of BCIS-equipped vehicles.

including reparables, consumables, post-production software support, and replacement training. Concerning the low-rate initial production decision, the Deputy Director stated that:

- the Army must provide the operations and maintenance funding before the low-rate initial production decision, and

- he would support a low-rate initial production decision if the Army funded all identified funding shortfalls in the Future Years Defense Program and made a commitment to fully fund the program to the approved Army Procurement Objective in the Budget Estimate Submission.

On June 30, 1999, the Program Executive Officer, Intelligence, Electronic Warfare and Sensors, briefed the Council, the Assistant Vice Chief of Staff of the Army, and the Military Deputy to the Army Acquisition Executive on the readiness of the BCIS to enter low-rate initial production. Subsequently, the Council recommended a limited, three-phase procurement of 1,169 BCIS units to equip the 4th Infantry Division.

On July 14, 1999, the Product Manager, Combat Identification, issued the "Modified Integrated Program Summary for the Battlefield Combat Identification System Low Rate Initial Production Decision," which revised the BCIS acquisition strategy to encompass a phased approach based on the Council direction and the availability of funding. The Modified Integrated Program Summary revised the BCIS Acquisition Strategy into three phases:

- low-rate initial production to procure 1,169 BCIS units for fielding to the 4th Infantry Division,

- full-rate production to field 15,245 BCIS units to the meet the Army Procurement Objective of 16,414 BCIS units, and

- a pre-planned product improvement to shift the BCIS frequency band to comply with a yet to be approved North Atlantic Treaty Organization Standardization Agreement.

On July 29, 1999, the Army Acquisition Executive further defined the low-rate initial production phase of the BCIS Acquisition Strategy and approved a limited, three-phase low-rate initial production of 1,169 BCIS units to equip the 4th Infantry Division.

- The first phase, in FY 1999, consisted of 10 units to support developmental testing.

- The second phase, in FY 2000, consisted of 127 units to support an initial operational test and evaluation.

- The third phase, from FY 2001 through FY 2007, consists of plans to procure an additional 1,032 units for the 4th Infantry Division.

Entry into the third phase, FY 2001 and beyond, was contingent on an in-process review chaired by the Military Deputy to the Army Acquisition Executive to verify system performance and reliability.

On October 7, 1999, the Army Acquisition Executive issued a letter to the Under Secretary of Defense for Acquisition, Technology, and Logistics stating that the Army was going forward with a three-phase procurement of 1,169 BCIS units without full funding for the Army procurement objective of 16,414 units (see Appendix C). The Army Acquisition Executive also stated that to disrupt planning or execution of other Army programs to fully fund the BCIS was not practical at that time in view of the uncertainties about BCIS reliability and interaction with situational awareness. He concluded that, after the Army completed its modeling and testing efforts and obtained some experience with BCIS in the 4th Infantry Division, the Army would be in a better position to decide on future procurement of the BCIS. However, if the Army decided to increase the BCIS procurement, it would be with a restructured acquisition program baseline and adequate funding.

For the in-process review, the Military Deputy to the Army Acquisition Executive was to determine whether the BCIS should continue with the third phase of low-rate initial production. At this in-process review, the Program Executive Officer, Intelligence, Electronic Warfare and Sensors, and the Product Manager, Combat Identification, were to:

- verify that BCIS meets system performance and reliability requirements;

- quantify through accredited modeling and simulation that BCIS reduces fratricide beyond that which situational awareness provides;

- present a comprehensive and coordinated plan for testing and integrating BCIS on host platforms; and

- present a comprehensive and coordinated plan for fielding BCIS with applicable training devices.

At the in-process review, the Product Manager presented field test data from a reliability development growth test to verify system performance and reliability. The field test data were primarily based on some modeling and simulation data and pre-production prototype demonstrations and tests. However, the data available did not adequately verify system performance and reliability of the production-prototype BCIS because of the lack of a current and comprehensive test and evaluation master plan (TEMP), as discussed in finding B. Further, this field test data is preliminary because the reliability development growth test will not conclude until April 2001. However, on February 20, 2001, the Military Deputy concluded that the BCIS had met the requirements for the in-process review based on the presentations by the Product Manager, Combat Identification, and the representatives from the user community, the independent test community, the training community, the program offices for major platforms that will receive the BCIS, and the unanimous recommendation by the Army Headquarters Overarching Integrated Product Team. Consequently, the

Military Deputy granted approval to implement the third phase of the low-rate initial production buy of an additional 1,032 units for the 4th Infantry Division predicated upon the completion of the reliability development growth test.

Effect of Continuing the Battlefield Combat Identification System Without Procurement Funds

Without a viable acquisition strategy for the BCIS, the Army had obligated about $132.4 million in research, development, test and evaluation and procurement funds for the BCIS through FY 2000, and plans to obligate another $86.5 million to complete the development effort in FYs 2001 through 2007 for the 4th Infantry Division. However, the Army had not obtained procurement and operations and maintenance funds necessary to acquire and support the BCIS procurement objective of 16,414 units or for the Army acquisition objective of 43,762 units.

Efforts Planned to Complete Development. The Army provided funding for the BCIS in the Army Research, Development, Test and Evaluation Budget Item Justification (R-2 Exhibit) and the Army Budget Item Justification Sheet (P-40 Exhibit). In the R-2 Exhibit, February 2000, Program Element No. 064817A/D482 for the Ground Combat Identification project shows research, development, test, and evaluation funding for the BCIS. For FY 2001, the R-2 Exhibits shows estimated funding of $2.4 million for the following efforts:

- complete host platform design and development effort for selected vehicle types in the 4th Infantry Division,

- provide technical support for the initial operational test and evaluation, and

- develop the North Atlantic Treaty Organization Standardization Agreement for combat identification.

However, the R-2 Exhibit does not include funding for BCIS from FY 2002 through FY 2005. The R-2 Exhibit, September 2000, also shows $2.4 million in research, development, test, and evaluation funding for the BCIS. However, the Exhibit does not identify the FY 2001 efforts and also does not include funding for the BCIS beyond FY 2001. Therefore, if the BCIS requires additional design improvements and testing, the funding will not be available.

In the P-40 Exhibit, September 2000, the Army requested procurement funds, totaling $61.8 million, from FY 2001 through FY 2007, to acquire 829 low-rate initial production BCIS units. The Army plans to use funding from the Abrams Tank and Bradley Fighting Vehicle programs to acquire the remaining quantities to achieve the low-rate initial production buy of 1,169 BCIS units, according to the Budget Production Schedule (P-21 Exhibit), September 2000. However, the P-21 and P-40 Exhibits do not show sufficient funding from FY 2006 through FY 2007 to acquire the Army procurement objective of 16,414 BCIS units. The

P-21 shows no funding beyond FY 2005 to equip Abrams Tanks and Bradley Fighting Vehicles with BCIS units and the P-40 shows funding for limited buys of 55 and 62 BCIS units for FYs 2006 and 2007, respectively.

Efforts to Equip the Warfighter. The Office of the Deputy Chief of Staff for Operations and Plans identified an Army procurement objective of 16,414 units. The Army funded the BCIS to procure 1,169 low-rate initial production units for the 4th Infantry Division at an average BCIS unit cost of about $42,000, according to the Product Manager, Combat Identification. The Army procurement objective of 16,414 units does not represent fielding BCIS to all Army vehicles expected to operate forward of the brigade support area, and the 1,169 low-rate initial production units are of limited value to the warfighter because the 4th Infantry Division, as the Army's First Digitized Division and Experimental Force, would not be the first heavy mechanized division to be deployed in a conflict. The 4th Infantry Division would be only one of many Army and allied forces[5] operating in the theater-of-action. Consequently, the availability of the BCIS for the 4th Infantry Division alone will not result in a significant reduction in the number of fratricide incidents that may occur because the 4th Infantry Division will be limited to identifying its own vehicles as friends and will not be able to differentiate whether other vehicles, including other Army and allied vehicles, in the theater-of-action are friend or unknown.

Funds Put to Better Use. By Army management not allowing the BCIS to continue with the third phase of low-rate initial production until it decides to fully fund the BCIS at the approved Army procurement objective, the Army could put the remaining $86.5 million[6] of research, development, test and evaluation and procurement funds to better use. The Army Cost Position as of August 6, 1999, estimated the total cost to acquire and support the 16,414 units identified in the Army procurement objective as $918.5 million. To acquire the 43,762 units needed to field BCIS to all Army units will cost about $1.8 billion.[7] Given the existing funding constraints, the unit cost, and the Army's estimate that 43,762 units are needed to field BCIS to all Army units, it is unlikely that the Army will have sufficient funding to acquire the quantity needed to protect soldiers from friendly ground fire. If the Army does not fully fund the BCIS for production, and continues to acquire low-rate initial production BCIS units to equip the 4th Infantry Division under the existing protracted fielding plan, Army warfighters will receive minimal benefit in the reduction of fratricide attributed to BCIS.

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[5]Allied countries will procure their own combat identification systems based on the North Atlantic Treaty Organization Standardization Agreement for combat identification, according to the Product Manager, Combat Identification.

[6]The Army planned a total of $2.4 million of research, development, test and evaluation funding for BCIS in FY 2001 and $84.1 million of procurement funding for BCIS in FYs 2001 through 2007. The procurement funding includes $19 million in FY 2001, $16.2 million in FY 2002, $16.1 million in FY 2003, $16.6 million in FY 2004, $5.9 million in FY 2005, $5.1 million in FY 2006, and $5.2 million in FY 2007.

[7]We calculated the $1.8 billion cost to acquire 43,762 units by using a unit cost of $42,000, which the Office of the Product Manager, Combat Identification, provided.

Management Comments on the Finding and Audit Responses

Summaries of management comments on the finding and our responses are in Appendix E.

Recommendation, Management Comments, and Audit Response

Redirected Recommendation. In the draft report, we directed the following recommendation to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology). We are redirecting the recommendation to the Under Secretary of Defense for Acquisition, Technology, and Logistics to ensure that the Army spends funds on efforts that it is committed to fully funding and that it has determined are affordable. We redirected the recommendation because the Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) approved the BCIS entering the third phase of low-rate initial production to procure an additional 1,032 BCIS units, costing about $43.3 million, without full funding for the program and without determining whether the program is affordable and fully met the needs of the user to reduce fratricide.

A. We recommend that the Under Secretary of Defense for Acquisition, Technology, and Logistics direct the Army to discontinue further funding of the Battlefield Combat Identification System until the Army provides full funding for the production phase of the program to meet user requirements and determines that the program is affordable.

Army Comments. The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), nonconcurred, stating that the Army Systems Acquisition Review Council and the milestone decision authority had considered the risks associated with continuing the third phase of the low-rate initial production and directed appropriate management actions to mitigate those risks. Further, the Deputy stated that the Army completed necessary testing to provide the Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) with sufficient data to make an informed assessment to proceed into the third phase of the low-rate initial production. For the complete text of the Deputy's comments, see the Management Comments section of the report.

Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space) Comments. Although not required to comment, the Deputy Assistant agreed with the recommendation. For the complete text of the Deputy Assistant's comments, see the Management Comments section of the report.

Audit Response. The Army comments were not responsive. The Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) should not have approved entrance into the third phase of the

low-rate initial production without the Army programming full funding for the BCIS. DoD Regulation 5000.2-R requires that the milestone decision authority not approve an acquisition program proceeding beyond program initiation unless sufficient resources, including staffing, are programmed in the most recently approved Future Years Defense Program or will be programmed in the next Program Objectives Memorandum, Budget Estimate Submission, or President's Budget. Further, Army Pamphlet 70-3 supplements DoD Regulation 5000.2-R and requires that full funding, which is the total cost for developing, procuring, and sustaining an acquisition program, be shown in the most recent Future Years Defense Program for all programs, regardless of acquisition category. Unless the Army fully funds the BCIS for procurement in the Future Years Defense Program to meet user requirements, it should discontinue further funding. Therefore, we request that the Under Secretary of Defense for Acquisition, Technology, and Logistics comment on this recommendation and direct the Army to spend its limited funds on programs that meet its funding priorities for full funding and procurement.

B. Comprehensive Test Planning Strategy

The BCIS did not have a current and comprehensive TEMP. Further, the Army lacked funding to test 19 operational requirements and did not plan to operationally test a production prototype of the system in cold, fog, snow, or rain. The TEMP, approved July 1993, was not suitable for testing the BCIS for the following reasons.

- The TRADOC System Manager did not update the operational requirements document (ORD) in accordance with new guidance requiring key performance parameters.

- The Office of the Joint Chiefs of Staff, Director for Command, Control, Communications, and Computers, did not certify the ORD for interoperability.

- The BCIS Product Manager did not ensure that planned operational tests addressed all BCIS operational requirements. Specifically, planned tests did not address requirements for operating in all environments, Service compatibility, system reliability and supportability, platform vulnerability to detection, and situational awareness linkage.

Without an updated TEMP that accurately shows user requirements, testers will not fully evaluate the effectiveness of the BCIS in reducing fratricide. As a result, the Army has increased the risk of producing a system that will not meet the full needs of the user. Also, the milestone decision authority will not have sufficient operational test data to assess the readiness of the BCIS to enter full-rate production.

Operational Requirements, Interoperability, Test and Evaluation Policy

Operational Requirements Policy. DoD Regulation 5000.2-R; Chairman of the Joint Chiefs of Staff Instruction 3170.01A, "Requirements Generation System," August 10, 1999; Army Regulation 73-1, "Test and Evaluation Policy;" February 27, 1995; and TRADOC Pamphlet 71-9, "Requirements Determination," November 5, 1999, provide policy on operational requirements.

DoD Regulation. DoD Regulation 5000.2-R requires the user or the user's representative to prepare the ORD based on validated needs to address mission area deficiencies, evolving threats, and emerging technologies or weapon system improvements. Further, the Regulation requires that the Military Department Chief of Staff or designated representative approve the ORD before each program milestone decision and submit it to the milestone decision authority to be used in the preparation of program documentation such as program baselines, specifications, and test and evaluation master plans.

Chairman of the Joint Chiefs of Staff Instruction. Chairman of the Joint Chiefs of Staff Instruction 3170.01A states that key performance parameters are those system capabilities or characteristics considered essential for successful mission accomplishment. The Instruction also states that the ORD should contain eight or less key performance parameters that capture the parameters needed to reach the overall desired capabilities for the system. Failure to meet an ORD key performance parameter threshold can be cause for the system selection to be re-evaluated or the program to be reassessed or terminated.

Army Regulation. Army Regulation 73-1 states that the program manager develops the critical technical parameters to attain the associated operational requirements in the projected threat environments. These critical technical parameters must be included in the independent developmental evaluation or assessment plan and, along with appropriate thresholds, in the TEMP.

TRADOC Pamphlet. The TRADOC Pamphlet 71-9 states that changes to an approved ORD are driven by lessons learned through analysis, testing, threat, technology, or mission needs and are approved by the Commanding General, TRADOC. Further, the Pamphlet states that ORD changes should be made to support a milestone decision review for approval to enter the engineering and manufacturing development phase and only on an exception basis for approval to enter the production phase.

Interoperability Policy. DoD Regulation 5000.2-R and Chairman of the Joint Chiefs of Staff Instruction 6212.01B, "Compatibility, Interoperability, Integration, and Supportability of Command, Control, Communications, Computers, Intelligence and Weapon Systems," May 8, 2000, provide guidance on interoperability.

DoD Regulation. DoD Regulation 5000.2-R requires the program manager to address compatibility, interoperability, and integration key goals for all acquisition programs and to ensure that these goals are achieved throughout the acquisition life-cycle for all acquisition programs. Further, the Regulation requires the Joint Interoperability Test Command to test and certify all Command, Control, Communications, Computers, and Intelligence (C^4I) systems having joint interoperability requirements before the production milestone decision. The Director, Defense Information Systems Agency, through the use of the Joint Interoperability Test Command, is to certify to the developmental and operational testing organizations and to the Chairman of the Joint Chiefs of Staff that C^4I systems and equipment meet the applicable requirements for compatibility, interoperability, and integration. The Regulation further requires program managers to prepare a C^4I support plan for all weapon systems that interface with C^4I systems.

Chairman of the Joint Chiefs of Staff Instruction. Chairman of the Joint Chiefs of Staff Instruction 6212.01B requires the Director for Command, Control, Communications, and Computers (J-6) to certify system ORDs before each milestone, regardless of acquisition category, for conformance with joint national security systems and interoperability standards. Also, the Director is to certify that interoperability key performance parameters are derived from

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information exchange requirements. Interoperability key performance parameters in an ORD define the level of interoperability for the proposed system.

Test and Evaluation Policy. DoD Regulation 5000.2-R and Army Pamphlet 73-2, "Test and Evaluation Master Plan Procedures and Guidelines," October 11, 1996, provide policy on test planning requirements.

   DoD Regulation. DoD Regulation 5000.2-R requires that the TEMP document the overall structure and objectives of the test and evaluation program. The TEMP provides a framework to generate detailed test and evaluation plans for tests that the program office requires before key program decision points and identifies developmental and operational tests and evaluations needed to support the decisions. Further, the Regulation requires the TEMP to correlate program schedules, test management, strategy and structure, and required resources to the objectives and thresholds in the ORD. For programs designated for Office of Secretary of Defense test and evaluation oversight, the Regulation requires the program manager to submit the TEMP to the Office of the Director, Operational Test and Evaluation, for review within 90 days of such designation.

   Army Pamphlet. Army Pamphlet 73-2 states that program managers for programs on the Office of Secretary of Defense test and evaluation oversight list must submit updated TEMPs to the Office of the Director, Operational Test and Evaluation, 45 days before a milestone review.

Current and Comprehensive Test and Evaluation Master Plan

The BCIS did not have a current and comprehensive TEMP. The condition occurred because the TRADOC System Manager did not update the ORD; the Office of the Joint Chiefs of Staff, Director for Command, Control, Communications, and Computers, did not certify the ORD for interoperability; and the BCIS Product Manager did not ensure that planned tests evaluated and addressed all operational requirements in the planned BCIS operating environment.

Operational Requirements Document. The TRADOC System Manager, the user representative, had not updated and received certification for the operational requirements document (ORD) since the Army approved it in April 1993. The April 1993 ORD did not contain key performance parameters. The user representative stated that he planned to update the ORD by March 2001[8] to comply with the Chairman of the Joint Chief of Staff Instructions 3170.01A and 6212.01B. In November 2000, after receiving the updated ORD from the user representative, the Director for Command, Control, Communications, and Computers (J-6) and the Director, Defense Information Systems Agency, reviewed the updated ORD and identified deficiencies in the defined interoperability requirements for use in determining system performance through testing. After the user representative corrects the ORD deficiencies and

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[8]In comments to the draft report, the Army stated that it plans to approve the ORD by April 2001.

resubmits the ORD, the Director for Command, Control, Communications, and Computers (J-6) and the Director, Defense Information Systems Agency, will again review the updated ORD for certification. After the Directors' certification, the Army Chief of Staff or designated representative must approve the updated ORD before the production milestone decision in June 2002.

In response to the draft report, the Army stated in March 2001 that the updated ORD includes an interoperability key performance parameter and that the TRADOC System Manager has taken action to achieve the required J-6 certification. However, as of March 2001, the Director for Command, Control, Communications, and Computers (J-6) had not certified the ORD for interoperability and the TRADOC System Manager had not provided its corrections on the ORD. Further, the operational testers must test and evaluate the BCIS against the key performance parameters in the updated ORD to assess the system's suitability and effectiveness.

The new updated ORD, if approved by April 2001, is after the in-process review in February 2001 that decided upon further procurement of 1,032 BCIS units for the third phase of the low-rate initial production decision, only about 3 months before the initial operational test and evaluation in the fourth quarter of FY 2001, and about 15 months before the full-rate production milestone decision planned in June 2002. Consequently, the Army may not be able to coordinate and approve the ORD in time to make necessary changes to the test plan and in resource requirements to affect the initial operational test and evaluation.

Test and Evaluation Master Plan. The Deputy Under Secretary of the Army for Operational Research approved the TEMP for the BCIS in July 1993 at the engineering and manufacturing development milestone decision. The July 1993 TEMP does not include planned testing for the upcoming FY 2001 initial operational test and evaluation and future follow-on operational tests. However, even though the BCIS Product Office does not have an updated ORD, its Test and Evaluation Working Integrated Product Team[9] has been revising the TEMP[10] in preparation for the production milestone decision in June 2002. Of the 66 BCIS requirements identified in the ORD, the Army plans to conduct full or partial operational testing for only 47 of those requirements in the initial operational test and evaluation. For the remaining 19 BCIS requirements, the September 2000 R-2 Exhibit shows that the BCIS program does not have research, development, test and evaluation funding to operationally test those requirements. The following table summarizes the BCIS requirements contained in the ORD and shows which requirements are critical operational issues, funded, and developmentally and operationally tested. Appendix D provides a more detailed discussion of BCIS operational requirements and planned testing.

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[9]Army Regulation 70-1 states that, for all acquisition category programs, the program manager will establish working level integrated product teams that focus on topics, such as test, cost and performance, contracting, and risk management.

[10]In comments to the draft report, the Army stated that it plans to approve the TEMP by early July 2001.

Summary of BCIS Requirements and Planned Testing

BCIS Requirements	Critical Operational Issue	Resourced and/or Funded	Developmental Test	Operational Test
Fully or Partially Tested	10	46	57	47
Not To Be Tested	5	13	9	19
Total	**15**	**59**	**66**	**66**

Of the 19 BCIS requirements not funded for testing, one relates to BCIS interoperability with situational awareness. Specifically, that requirement is the ability of the BCIS to correlate target identification and situational awareness information in the future. To satisfy this operational requirement, the Product Manager, Combat Identification, expended funds to create a digital linkage between BCIS and Army units that provides target identification data to a situational awareness and command and control information system.[11] However, the July 1993 TEMP does not explain how the Army will correlate test target identification information with situational awareness. Specifically, the TEMP does not show how the user will use BCIS information to update the situational awareness and command and control information system or how the Army will distribute that information to other Army, DoD, and allied platforms. As a result, the Army will not know, through this test, whether the BCIS can meet this operational requirement. In view of the critical nature of combat identification interoperability and the importance of fratricide reduction, the Office of the Director, Operational Test and Evaluation, personnel stated that they would include the BCIS on their test and evaluation oversight list.[12]

Realistic Testing of Operational Requirements

The Product Manager did not ensure that planned operational tests addressed requirements for operating in all operational environments, Service compatibility, system reliability and supportability, platform vulnerability to detection, and situational awareness linkage.

Operating in all Environments. The ORD requires the BCIS to operate in hot, basic, and cold climates. The Army Test and Evaluation Command plans to operationally test BCIS in a hot environment during the initial operational test and evaluation in the summer of 2001 at Fort Hood, Texas. The TEMP for the BCIS identifies operational testing under all battlefield and weather conditions as a critical issue.[13] The Army Test and Evaluation Command, to be cost

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[11]Referred to as the Force XXI Battle Command Battalion/Brigade and Below System.

[12]In response to the draft report, the Acting Director, Operational Test and Evaluation, stated that he designated the BCIS for test and evaluation oversight in November 2000.

[13]Critical issues are those aspects of a system's capability, operational, technical, or other, that must be questioned before a system's overall suitability can be known. Critical issues are important to the decision authority in deciding whether to allow the system to advance to the next phase of development.

effective, plans to verify BCIS operational requirements by a combination of developmental testing, operational testing, and modeling. Under Army Test and Evaluation Command oversight, the contractor will conduct developmental testing of a BCIS production prototype to evaluate BCIS performance in cold climates in FY 2001; however, the Army does not plan to conduct operational testing of a production prototype in a cold climate. Further, according to the Product Manager, the Army will only operationally test BCIS in the basic to hot climates under dusty and clear conditions. None of these developmental or operational tests will test the BCIS in fog, snow, or rain. Consequently, the Army Test and Evaluation Command plans to use a model to simulate fog, snow, and rain to evaluate BCIS capabilities in those environments.

During the initial operational test and evaluation, the Army will test the BCIS in a limited operational test using only Abrams Tanks and Bradley Fighting Vehicles as host vehicles against gunnery range target silhouettes with BCIS bolted on to both the host vehicles and target silhouettes. Additionally, during the developmental test in FY 2001, the Army will conduct a product verification test on the High Mobility Multipurpose Wheeled Vehicle for reliability data. The Army has more than 20 different vehicle platforms that will host the BCIS. Operational testing on only two platforms, the Abrams Tank and the Bradley Fighting Vehicle, and developmental testing on the High Mobility Multipurpose Wheeled Vehicle will not realistically represent the battlefield environment. For example, the wheeled scout vehicle is not a part of the operational test; however, it must interrogate and transpond in the same manner as the Bradley Fighting Vehicle and the Abrams Tank. Therefore, the Army will have incomplete test results concerning the utility of the BCIS on all vehicles in an Army division before the planned production decision.

Service Compatibility. The Army had not planned a joint operational test to ensure that the BCIS is compatible with Air Force, Navy, Marine Corps, and allied vehicle platforms. However, the Army planned to conduct a force-on-force evaluation simulation using the Combined Arms and Support Task Force Evaluation model to determine ground vehicle fratricide rates. This model will simulate warfighting scenarios for ground forces; however, the TEMP does not describe the scenarios involving the BCIS.

Reliability and Supportability. During March 2001, the Army plans to conclude a test of BCIS reliability at the contractor's facility during developmental testing using a reliability growth process.[14] Specifically, the Army Test and Evaluation Command will test to a 70 percent confidence level to determine whether the BCIS satisfies the operational requirement for reliability to operate continuously, 24 hours per day, with a threshold mean-time between failure rate of 1,242 hours. However, the Product Manager, Combat Identification, has no research, development, testing, and evaluation funds beyond FY 2001 to correct or improve any reliability deficiencies identified during the reliability growth process.

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[14]Reliability growth testing is an iterative process intended to rapidly and steadily improve reliability using a systematic engineering process of test-analyze-fix-retest where equipment is tested under actual, simulated, or accelerated environments.

Platform Vulnerability to Detection. When the Army installs the BCIS on a vehicle platform, the ORD requires that it not be more detectable by threat forces than before the BCIS installation. However, the Army Test and Evaluation Command will not evaluate the potential increase in BCIS-equipped platforms to detection by enemy sensors because an earlier test on pre-production prototypes determined that the BCIS would be very hard to detect and exploit by an enemy sensor. In response to the report, the Army stated that, under the current test strategy, the Army Test and Evaluation Command plans to evaluate the potential increase in BCIS-equipped platforms to detection by enemy sensors belonging to threat forces. The evaluation will be based on an analysis that the Army Survivability Lethality Analysis Directorate will conduct on the results of planned vulnerability tests on the BCIS in from April through May 2001, as well as previous test results from earlier versions of the BCIS that the Army deems relevant to the current version of the BCIS.

Situational Awareness Linkage. The Army does not plan to operationally test the BCIS with the Force XXI Battle Command Battalion/Brigade and Below System until FY 2004 to determine whether they work in concert to reduce fratricide. In March 1998, the Military Deputy to the Army Acquisition Executive testified before Congress concerning land-force modernization that the Army's operational concept for combat identification relies on situational awareness and target identification working in concert. In February 1999, he also testified before Congress concerning protection equipment and countermeasure devices that data links are a very important part of the Army's overall combat identification solution. Further, the ORD and the C^{4}I Support Plan require that the BCIS be able to provide target identification information to situational awareness systems. The Product Manager funded efforts to develop a link between the BCIS and the Force XXI Battle Command Battalion/Brigade and Below System, situational awareness system. However, the planned initial operational test and evaluation in the fourth quarter of FY 2001 will not test or evaluate the link to determine how effectively the BCIS passes target identification data to the Force XXI Battle Command Battalion/Brigade and Below System. Instead, the Product Manager, Combat Identification, plans to rely on a follow-on operational test and evaluation in FY 2004, funded by the Army Test and Evaluation Command to determine whether the BCIS and the Force XXI Battle Command Battalion/Brigade and Below System work in concert to reduce fratricide. Consequently, without operationally testing the BCIS with the Force XXI Battle Command Battalion/Brigade and Below System before FY 2004, the Army made decisions at its in-process review in February 2001 and will make decisions at its full-rate production decision review in June 2002 concerning acquiring additional BCIS units without knowing whether situational awareness and target identification are working in concert.

Effect of Operational Testing Without Current Operational Requirements and Test Plan

Without an updated TEMP for the BCIS that accurately shows user requirements, testers will not fully evaluate the effectiveness of the BCIS in reducing fratricide. An updated TEMP should be based on an ORD, approved

for interoperability, and should accurately include tests for user operational requirements and for situational awareness interoperability. Consequently, the Army should have delayed the BCIS in-process review and not committed to the procurement of an additional 1,032 BCIS units, costing about $43.3 million,[15] until it updated the TEMP for the BCIS, completed the initial operational test and evaluation, and tested for situational awareness interoperability. By updating the TEMP, the Army operational testers will be able to test the BCIS to:

- determine whether BCIS meets the user's needs, including situational awareness interoperability when certified by the Joint Chiefs of Staff;

- identify current and future schedule and resource constraints that have an impact on program schedule, test management strategy and structure, and resources required to evaluate critical operational issues, objectives, and thresholds documented in the updated ORD; and

- provide operational test data based on an updated TEMP to the milestone decision authority to assess the readiness of the BCIS to enter full-rate production in June 2002.

If the Army had delayed the in-process review until it had an updated and approved ORD and TEMP, it would have decreased the risk of producing additional BCIS units that do not fully meet the needs of the user to reduce fratricide.

Management Comments on the Finding and Audit Responses

Summaries of management comments on the finding and our responses are in Appendix E.

Recommendations, Management Comments, and Audit Responses

B.1. We recommend that the Army Training and Doctrine Command System Manager for the Battlefield Combat Identification System update the operational requirements document for the Battlefield Combat Identification System before March 2001 to include corrected deficiencies that the Director for Command, Control, Communications, and Computers (J-6) and the Director, Defense Information Systems Agency, identified.

Army Comments. The Deputy for Systems Management and Horizontal Technology Integration did not specifically address the recommendation. However, in his overall comments to the report, he stated that the Army

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[15]We calculated the $43.3 million cost to acquire 1,032 BCIS units by using a unit cost of $42,000, which the Office of the Product Manager, Combat Identification, provided.

Training and Doctrine Command System Manager updated the ORD and provided it to the Director for Command, Control, Communications, and Computers (J-6) and the Director, Defense Information Systems Agency, for review. The Deputy anticipates ORD approval by April 2001. For the complete text of the Deputy's comments, see the Management Comments section of this report.

Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space) Comments. Although not required to comment, the Deputy Assistant noted that the Army was updating the ORD for the BCIS. For the complete text of the Deputy Assistant's comments, see the Management Comments section of this report.

Acting Director, Operational Test and Evaluation Comments. Although not required to comment, the Acting Director stated that the Army should implement the recommendation as soon as practicable. For the complete text of the Acting Director's comments, see the Management Comments section of this report.

Audit Response. The Army comments were responsive. However, as of March 2001, the Director for Command, Control, Communications, and Computers (J-6) and the Director, Defense Information Systems Agency, had not certified the updated ORD for the BCIS. Both organizations nonconcurred with a previously updated version of the ORD in November 2000. The J-6 stated that the updated ORD must pass a certification phase before Army final approval. Until the ORD is approved, the Army cannot finalize the TEMP, which provides the overall structure and objectives for the initial operational test and evaluation to determine whether BCIS meets user operational requirements.

B.2. We recommend that the Director, Operational Test and Evaluation, designate the Battlefield Combat Identification System for oversight, and review the updated Battlefield Combat Identification System test and evaluation master plan, detailed test plans, and operational test results before March 2001.

Acting Director, Operational Test and Evaluation Comments. The Acting Director concurred, stating that he designated the BCIS for test and evaluation oversight in November 2000.

Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space) Comments. Although not required to comment, the Deputy Assistant noted that the Director, Operational Test and Evaluation, had agreed to designate the BCIS for oversight.

B.3. We recommend that the Product Manager, Combat Identification:

a. Update the test and evaluation master plan to accurately show current and future tests and evaluations, resource and schedule activities, and the test management strategy and structure as derived from the updated operational requirements document for the Battlefield Combat Identification System.

Army Comments. The Deputy for Systems Management and Horizontal Technology Integration did not specifically address the recommendation. However, in his overall comments on the report, the Deputy stated that he anticipates TEMP approval by early July 2001. Further, the Deputy stated the Army was satisfied that the requirements in the updated ORD and the test program shown in the TEMP provide an adequate basis for the testers to determine whether the production hardware fully meets user needs.

Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space) Comments. Although not required to comment, the Deputy Assistant noted that the Army was updating the TEMP for the BCIS.

Acting Director, Operational Test and Evaluation Comments. Although not required to comment, the Acting Director stated that the Army should implement the recommendation as soon as practicable.

Audit Response. The Army comments were responsive. However, if the updated ORD and TEMP are not approved before the initial operational test and evaluation in the fourth quarter of FY 2001, the Army should delay the initial operational test and evaluation. If the Army proceeds with its initial operational test and evaluation without an approved and updated ORD and TEMP, it will not be able to determine whether the BCIS will reduce fratricide and will not be able to provide operational test data, based on an updated TEMP, to the milestone decision authority to assess the readiness of the BCIS to enter full-rate production.

b. Delay the January 2001 In-Process Review until the Army completes its testing as identified in the updated Battlefield Combat Identification System test and evaluation master plan before deciding on procurement of an additional 1,032 Battlefield Combat Identification System units for further low-rate initial production.

Army Comments. The Deputy for Systems Management and Horizontal Technology Integration did not specifically address the recommendation. However, in his overall comments to the report, he stated that the Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) convened the in-process review on February 20, 2001. The Military Deputy concluded that the Army met all the requirements for the in-process review and granted approval to implement the third phase of the low-rate initial production after the reliability development growth test that was in process was completed.

Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space) Comments. Although not required to comment, the Deputy Assistant thought that the recommendation should be deleted because the Army had completed the in-process review and approved the third phase of BCIS low-rate initial production.

Acting Director, Operational Test and Evaluation Comments. Although not required to comment, the Acting Director stated that the Army should implement the recommendation as soon as practicable.

Audit Response. The Army comments were not responsive. According to the BCIS Acquisition Strategy, the third phase of the low-rate initial production was to procure an additional 1,032 BCIS units, costing about $43.3 million, for the 4th Infantry Division over a 7-year period--not to support developmental testing or initial operational test and evaluation. DoD Instruction 5000.2-R states that the objective of low-rate initial production is to produce the minimum quantity necessary to provide production configured articles for operational test, establish an initial production base for the system, and permit an orderly increase in the production rate for the system that is sufficient to lead to full-rate production after successful operational testing. Further, the Army decision to procure 1,032 BCIS units for the third phase of the low-rate initial production was not justified because the Army:

- had not fully funded the BCIS,

- planned to only field to the 4th Infantry Division, and

- previously approved first and second phases of the low-rate initial production to provide 137 BCIS units to support developmental testing and initial operational test and evaluation.

Appendix A. Audit Process

Scope and Methodology

We reviewed documentation dated from April 1992 to November 2000. We interviewed and obtained documentation from the staffs of the Office of the Joint Chiefs of Staff; the Assistant Secretary of Defense (Command, Control, Communications and Intelligence); the TRADOC; the Assistant Secretary of the Army (Acquisition, Logistics, and Technology); the Director, Operational Test and Evaluation; the Defense Information Systems Agency; the Director of the Army Staff; the Army Deputy Chief of Staff for Operations and Plans; the Army Test and Evaluation Command; the Program Executive Officer for Intelligence, Electronic Warfare, and Sensors; and the Product Manager, Combat Identification. Because the BCIS was in the late phase of engineering and manufacturing development, the audit concentrated on whether management was cost-effective in readying the system for the production phase of the acquisition process. Consequently, we focused our review on the areas of requirements generation, acquisition planning, program assessments and decision reviews, and test and evaluation.

Auditing Standards. We conducted this program audit from June through December 2000 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. Accordingly, we included tests of management controls considered necessary.

Use of Computer-Processed Data. We did not rely on computer-processed data to perform this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within the DoD. Further details are available on request.

DoD-Wide Corporate-Level Government Performance and Results Act Coverage. In response to the Government Performance and Results Act, the Secretary of Defense annually establishes DoD-wide corporate level goals, subordinate performance goals, and performance measures. This report pertains to achievement of the following corporate level goal and subordinate performance goal.

- **FY 2001 DoD Corporate-Level Goal 2:** Prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities. Transform the force by exploiting the Revolution in Military Affairs, and reengineer the Department to achieve a 21st century infrastructure. **(01-DoD-2)**

- **FY 2001 Subordinate Performance Goal 2.4:** Meet combat forces' needs smarter and faster, with products and services that work better and cost less, by improving the efficiency of the DoD acquisition processes. **(01-DoD-2.4)**

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the DoD Weapons Systems Acquisition high-risk area.

Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, and DoD Instruction 5010.40, "Management Control (MC) Program Procedures," August 28, 1996, require DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of the Review of the Management Control Program. In accordance with DoD Regulation 5000.2-R, acquisition managers are to use program cost, schedule, and performance parameters as control objectives to implement the requirements of DoD Directive 5010.38. Accordingly, we limited our review to management controls directly related to requirements generation, acquisition planning, program assessments and decision reviews, and test and evaluation. We reviewed management's self-evaluation applicable to those controls.

Adequacy of Management Controls. We identified a material management control weakness for the BCIS as defined by DoD Directive 5010.40. The management controls for program documentation were not adequate to ensure that the Office of the Product Manager, Combat Identification, periodically reviewed the ORD and TEMP for the BCIS for currency, applicability, and compliance. Recommendations B.1., B.2., and B.3.a., if implemented, will ensure that the documents are up-to-date and in compliance with Army guidance, and that the testing conducted will address approved system operational and interoperability requirements. We will provide a copy of the report to the senior official responsible for management controls in the Office of the Assistant Secretary of the Army (Financial Management and Comptroller).

Adequacy of Management's Self-Evaluation. In the "Product Manager, Combat Identification, Management Controls Assurance Statement," January 28, 2000, the Internal Management Control Administrator identified the ORD as part of an assessable unit within the Programmatics section of the statement. The Programmatics section addressed the cost, schedule, and performance characteristics of the BCIS and the Combat Identification for the Dismounted Soldier programs under the cognizance of the Product Manager, Combat Identification. The statement did not identify a management control weakness for the ORD even though the assessment was based on a review of whether the document was up-to-date, applicable, and compliant. For instance, the ORD requires the BCIS to have the capability to work in a dismounted role. In its current configuration, the BCIS is not suitable for dismounted soldiers because of weight constraints; however, the Product Manager will achieve the

capability in the Combat Identification for the Dismounted Soldier Program.[16] Additionally, the statement did not assess the TEMP for the BCIS and whether the program had a comprehensive and up-to-date test-management strategy and structure to address approved operational and interoperability requirements. As a result, the administrator did not identify or report the material management control weakness for the TEMP identified in the audit.

Prior Coverage

During the last 5 years, the General Accounting Office issued two reports addressing the BCIS.

Report No. NSIAD-99-206,[17] "DoD Training Can Do More to Help Weapon System Programs Implement Best Practices," August 16, 1999

Report No. NSIAD-95-153 (OSD Case No. 9936), "Changes Needed in Management Plans and Structure," September 14, 1995.

Management Comments on Management Control Program Review

Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) Comments. The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), provided comments on the "Adequacy of Management's Self-Evaluation." The Deputy stated that the report was correct in stating that the management control program did not ensure that Army management periodically reviewed program documents to determine whether they were up-to-date and in compliance with Army guidance. Further, the Deputy stated that the TRADOC System Manager had accommodated recommendations by the Director for Command, Control, Communications, and Computers (J-6); and the Director, Defense Information Systems Agency, concerning the ORD. The Deputy expects approval of the ORD by April 2001. The Deputy also stated that the Product Manager, Combat Identification, along with the BCIS Test Working-Level Integrated Product Team was updating the TEMP to show tests and evaluations, resource and schedule activities, and a test management strategy that is based on the updated ORD. The Deputy expects approval of the TEMP in early July 2001. Further, the Deputy stated that the Product Manager had implemented measures to strengthen the management control process so that the annual assessment will identify documents that are not up-to-date, applicable, and compliant.

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[16]The Office of the Product Manager, Combat Identification, is responsible for the BCIS and for the Combat Identification for the Dismounted Soldier Program. The Combat Identification for the Dismounted Soldier Program is developing a battlefield identification capability for dismounted ground maneuver forces to identify friendly troops.

[17]The report does not have an OSD case number.

Appendix B. Definitions of Technical Terms

Acquisition Category II. Acquisition Category (ACAT) II programs are defined as those acquisition program that do not meet the research, development, test and evaluation and procurement dollar thresholds for an ACAT I, major Defense acquisition program or an ACAT IA, major automated information system. The milestone decision authority is the DoD Component Acquisition Executive.

Acquisition Program Baseline. The acquisition program baseline embodies the cost, schedule, and performance objectives for the program.

Acquisition Strategy. An acquisition strategy is a business and technical management approach designed to achieve program objectives within the resource constraints imposed. It is the framework for planning, directing, contracting for, and managing a program. It provides a master schedule for research, development, test, production, fielding, modification, postproduction management, and other activities essential for program success. The acquisition strategy is the basis for formulating functional plans and strategies.

Army Procurement Objective. The Army procurement objective is what the Army is going to acquire in the Program Objectives Memorandum or the Out-Years, or both.

Brigade Support Area. The brigade support area is a designated area in which combat service support elements from division support command and corps support command provide logistic support to a brigade. The forward support battalion manages the terrain and unit locations. Examples of units located in the brigade support area are command posts, supply companies, ammunition transfer points, and forward support medical companies.

Budget Estimate Submission. The budget estimate submission is the DoD Component's budget submissions to the Office of the Secretary of Defense showing budget requirements for inclusion in the DoD budget.

Combat Identification. Combat identification is a subset of and complement to situational awareness. Each can enhance the effectiveness of the other, and both contribute to avoiding fratricide and improving combat effectiveness.

Command and Control. Command and control is the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission.

Critical Issue. A critical issue is an aspect of a system's capability, operational, technical, or other, that must be questioned before a system's

overall suitability can be known. Critical issues are of importance to the decision authority in reaching a decision to allow the system to advance to the next phase of development.

Critical Operational Issue. A critical operational issue is an issue of operational effectiveness and operational suitability (not parameters, objectives, or thresholds) that must be examined in operational test and evaluation to determine the system's capability to perform its mission. A critical operational issue is normally phrased as a question that must be answered to properly evaluate operational effectiveness or operational suitability.

Engineering and Manufacturing Development. The objective of the engineering and manufacturing development phase in the acquisition process is to translate the most promising design approach into a stable, interoperable, producible, and cost-effective design; validate the manufacturing process; and demonstrate system capabilities through testing. The intended output of the phase is, as a minimum, a preproduction system which closely approximates the final product, the documentation necessary to enter the production phase, and the test results that demonstrate that the production product will meet stated requirements.

Force XXI Battle Command Battalion/Brigade and Below System.
Force XXI Battle Command Battalion/Brigade and Below System, which the Army commonly refers to as "FBCB2," is a digital communications system that provides situational awareness for all levels of command on the battlefield.

Fratricide. Fratricide is the use of friendly weapons and munitions with the intent to kill enemy personnel or destroy their equipment or facilities, resulting in unforeseen and unintentional deaths or injury to friendly personnel.

Full Funding. Full funding is a DoD policy that applies to research, development, test and evaluation; procurement; and military construction appropriation accounts, and is defined in the DoD Financial Management Regulation. Full funding incorporates two related, but different policies. The first states that a DoD Component must identify and set aside sufficient funds in its Future Years Defense Program to cover the Component's best estimate of the annual cost for the program in each fiscal year of the Future Years Defense Program and must keep the estimate current. The second states that the DoD Component must provide sufficient funding in the annual appropriation of funds for the total estimated costs to be incurred in the delivery of a given quantity of a usable end item.

Full-Rate Production. Full-rate production is contracting for economic production quantities following stabilization of the system design and validation of the production process.

Future Years Defense Program. The Future Years Defense Program is the official DoD document that summarizes forces and resources associated with programs approved by the Secretary of Defense. Its three parts are the organizations affected, appropriations accounts, and the 11 major force programs.

Information Exchange Requirements. Information exchange requirements characterize the information exchanges to be performed by a proposed system and identify who exchanges what information with whom as well as why the information is necessary and how the users will employ that information.

Initial Operational Test and Evaluation. Initial operational test and evaluation is testing conducted on production, or production representative articles, to determine whether systems are operationally effective and suitable for intended use by representative users to support the decision to proceed beyond low-rate initial production.

Integrated Product Team. An integrated product team is a team composed of representatives from all appropriate functional disciplines working together to build successful programs, identify and resolve issues, and make sound and timely recommendations to facilitate decision making.

Key Performance Parameters. Key performance parameters are capabilities or characteristics so significant that failure to meet the threshold or minimum acceptable value can be cause for the concept or system selected to be reevaluated or the program to be reassessed or terminated.

Life-Cycle Cost. The life-cycle cost is the total cost to the government of acquisition and ownership of a system over its useful life. It includes the cost of development, acquisition, operations, and support (to include manpower), and where applicable, disposal.

Low-Rate Initial Production. Low-rate initial production is the minimum number of systems to provide production representative articles for operational test and evaluation, to establish an initial production base, and to permit an orderly increase in the production rate sufficient to lead to full-rate production upon successful completion of operational testing.

Materiel Developer. A materiel developer is a command or agency responsible for research and development and production validation of an item.

Minimum Operational Performance Requirement. A minimum operational performance requirement is the most important user or user-representative generated performance needs developed to address mission area deficiencies, evolving threats, and emerging technologies.

Milestone Decision Authority. The milestone decision authority is the individual designated in accordance with criteria established by the Under Secretary of Defense for Acquisition, Technology, and Logistics to approve entry of a program into the next phase of the acquisition process.

National Security System. A national security system consists of those telecommunications and information systems that DoD operates. The function, operation, or use of those systems involves equipment that is an integral part of a weapon or weapons systems.

Objective. The objective is the performance value that is desired by the user and which the program manager is attempting to obtain that represents an operationally meaningful, time critical, and cost effective increment above the performance threshold.

Operational Requirements Document. The ORD shows the users objectives and minimum acceptable requirements for operational performance of a proposed concept or system.

Out-Years. Out-years are 6 years beyond the year being worked in the upcoming budget and are used to refer to years beyond the current Future Years Defense Program. For example, the Future Years Defense Program covers 2002 to 2007, out-years are 2008 and beyond.

Performance. Performance is an operational and support characteristic of a system that allows it to effectively and efficiently perform its assigned mission over time. The support characteristics of the system include both supportability aspects of the design and the support elements necessary for system operation.

Pre-Planned Product Improvement. A pre-planned product improvement includes improvements planned for ongoing systems that go beyond the current performance envelope to achieve a needed operational capability.

President's Budget. The President's budget is the Federal Government budget for a particular fiscal year transmitted on the first Monday in February to the Congress by the President in accordance with the Budget Enforcement Act of 1992.

Program Objectives Memorandum. The Program Objectives Memorandum is an annual memorandum submitted to the Secretary of Defense by the DoD component heads that recommends the total resource requirements and programs within the parameters of the Secretary of Defense's fiscal guidance. It is the principal programming document that details how a DoD component proposes to respond to assignments in the defense planning guidance and satisfy its assigned functions in the Future Years Defense Program. The Program Objectives Memorandum shows programmed needs for 5 or 6 years hence, and includes staffing, force levels, procurement, facilities, and research and development.

Reliability. Reliability is the ability of a system and its parts to perform its mission without failure, degradation, or demand on the support system.

Reliability Growth Testing. Reliability growth testing is an iterative process intended to rapidly and steadily improve reliability using a systematic engineering process of test-analyze-fix-retest where equipment is tested under actual, simulated, or accelerated environments.

Research, Development, Test and Evaluation. Research, development, test and evaluation are activities for the development of a new system that include basic and applied research, advanced technology development, demonstration and validation, engineering development, developmental and operational testing and the evaluation of test results.

Situational Awareness. Situational awareness is knowledge of the tactical environment; that is, knowledge of where friendly, enemy, and neutral forces are located.

Standardization Agreement. A standardization agreement is the record of an agreement among several or all the North Atlantic Treaty Organization member nations to adopt like or similar military equipment, ammunition, and supplies; and operational, logistical, and administrative procedures.

Tactics, Techniques, and Procedures. Tactics are the art and science of employing available means to win battles and engagements. Techniques are methods that commanders and troops use to perform assigned missions and functions using equipment and personnel. Procedures are the standards and detailed courses of action that describe how to perform a task.

Test and Evaluation Master Plan. The test and evaluation master plan (TEMP) documents the overall structure and objectives of the test and evaluation program. It provides a framework within which to generate detailed test and evaluation plans and it documents schedule and resource implications associated with the test and evaluation program. The TEMP identifies the necessary developmental test and evaluation, operational test and evaluation, and live fire test and evaluation activities. Further, the TEMP relates program schedule, test management strategy and structure, and required resources to: critical operational issues; critical technical parameters; objectives and thresholds documented in the ORD; evaluation criteria; and milestone decision points.

Threshold. A threshold is the minimum acceptable value of performance which, in the user's judgment, is necessary to satisfy the need.

Requirement Threshold. A requirement threshold is a threshold noted in the ORD, but not as a critical issue or minimum operational performance requirement.

Appendix C. Army Acquisition Executive Memorandum

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
ACQUISITION LOGISTICS AND TECHNOLOGY
103 ARMY PENTAGON
WASHINGTON DC 20310-0103

7 OCT 1999

REPLY TO
ATTENTION OF

SAAL-ZD

Honorable Jacques S. Gansler
Under Secretary of Defense
  (Acquisition and Technology)
3010 Defense Pentagon
Washington, D. C. 20510

Dear Jacques:

I am sending this letter to apprise you of an acquisition we are moving out on that is somewhat out of the ordinary. The subject is our Battlefield Combat Identification System (BCIS), a ground "IFF" system which is intended to reduce fratricide among our direct fire weapons platforms. This ACAT II system has been on our books for about seven years. The technology looks promising, but we still need to confirm the reliability of early production hardware as well as assess the system's operational contribution in the context of a digital force with platform situational awareness. In part, the need to address these issues stems from the circumstance that, early in the BCIS program, situational awareness emerged as another approach to reducing fratricide. For practical purposes the BCIS program has been slowed down to sort out its role.

Our recent Army Systems Acquisition Review Council (ASARC) for BCIS recommended a limited, three-phase procurement of 1,169 BCIS sets to equip the First Digitized Division (FDD). The first phase of ten systems is to support technical testing. The second phase of 127 systems is to support an Initial Operational Test. The third phase would be to procure the additional 1032 systems for the Fourth Infantry Division, our Experimentation Force and FDD.

In view of the uncertainties about reliability and interaction with situational awareness, I believe that the limited program we have laid out is a prudent one. It will enable us to learn about the system capabilities and resolve those uncertainties with a combination of technical and operational testing supported by combat modeling. I have approved the BCIS Acquisition Program Baseline (APB), which is fully funded to execute the program described above.

What is unusual is that the users' procurement objective is currently documented to be 16,414 systems. We are going forward with only a 1,169 system program without the full funding for the larger buy. I did not feel it was practical at this time to disrupt planning or execution of other programs to

accommodate the policy of a "fully funded" BCIS program in view of the uncertainties to be resolved. After we learn from the modeling, testing and experience with BCIS in the FDD, we will be in a much better position to decide on future procurement. Of course, if we do decide to increase the BCIS procurement, it will be with a restructured APB and adequate funding. I trust that you will understand my logic for dealing with these complications.

Sincerely,

Paul J. Hoeper
Army Acquisition Executive

CF:
Honorable Dave Oliver, Prin Dep Under Sec of Def (Acq & Tech)
MG Robert Hicks, Dir PA&E
Ms. Erin Olms, Prin Dep Assist Sec (FM & Comptroller)
Mr. Bob Young, Deputy for Cost Analysis, OASA(FM&C)

Appendix D. Battlefield Combat Identification System Operational Requirements

The table below compares the ORD for the BCIS to the critical operational issue criteria,[1] funding, and developmental and operational testing. The July 1993 TEMP and the Working Test and Evaluation briefings, June 14, 2000, were the basis for developmental and operational testing. Of the 66 BCIS requirements identified in the ORD, 47 requirements will undergo full or partial initial operational testing before the full-rate production decision. Of those 47 requirements, 8 requirements are critical issues;[2] however, the Army will not operationally test 2 of those 8 requirements under all of the conditions stated in the ORD. Testing results obtained on the critical issues will support both the in-progress review and the production milestone decision. Of the 47 requirements, the Working Integrated Product Team identified 9 minimum acceptable operational performance requirements. Of the 19 remaining requirements that the Army will not operationally test, 4 requirements identify thresholds that BCIS must meet. Specifically, 2 of the 4 requirements relate to dismounted forces, 1 requirement relates to modularity of major functional elements, and 1 requirement relates to interoperability with situational awareness.

In this appendix, the critical operational issues are highlighted in gray boxes with normal type. Additionally, the critical issues and the minimum acceptable operational performance requirements are highlighted in gray boxes with **bold** type and gray boxes with *Italics* type, respectively.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
1. BCIS will combine Target Identification (TI) and Situational Awareness (SA) capabilities used by Combat, Combat Support, and Combat Service Support units.	NO	YES	YES	NO[3]

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[1]Critical operational issues are operational effectiveness and operational suitability issues (not parameters, objectives, or thresholds) that must be examined in operational test and evaluation to determine the system's capability to perform its mission. A critical operational issue is normally phrased as a question that must be answered to properly evaluate operational effectiveness or operational suitability.

[2]Critical issues are those aspects of a system's capability, operational, technical, or other, that must be questioned before a system's overall suitability can be known. Critical issues are of importance to the decision authority in reaching a decision to allow the system to advance to the next phase of development.

[3]The Product Office, Combat Identification, does not plan to conduct a combined operational test of target identification and situational awareness during the initial operational test and evaluation for the BCIS; however, the Product Office does plan to conduct an operational test of the BCIS and the Force XXI Battle Command Battalion/Brigade and Below System as part of the Follow-on Operational Test and Evaluation in FY 2004 even though the Product Office is not resourced for the test.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
2. TI will be used to positively identify friendly ground and air platforms in the Ground to Ground and dismounted ground maneuver forces (mounted and dismounted), Air to Ground (rotary wing), Air to Air (rotary wing).	NO	PARTIAL[4]	NO	PARTIAL[5]
3. Units that receive BCIS will conduct missions throughout the continuum of military operations.	NO	YES	YES	NO[6]
4. Near-term BCIS will rely upon Global Position System, Integrated Vehicular Information System and Enhanced Position Location Reporting System for position information.	NO	YES	YES	YES
5. Far-term BCIS shall consist of a joint, fully integrated positive friend, hostile, and neutral and noncombatant identification, communication, and Position/Navigation system that provides on-platform correlation of TI and SA.[7]	NO	YES	YES[8]	NO
6. BCIS must be operationally compatible with appropriate Air Force, Navy, and Marine Corps systems.	NO	YES[9]	YES	NO[10]

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[4]Partial, because the Army has only funded efforts to positively identify friendly ground-to-ground vehicles and dismounted ground maneuver forces.

[5]Partial, see footnote 5.

[6]The Army did conduct numerous military exercises and demonstrations in the past 7 years exercises; however those exercises and demonstrations used pre-production prototype BCIS units.

[7]The Army does not have research, development, testing and evaluation funds for testing or further integration of this requirement after FY 2001, according to the BCIS September 2000 R-2 form.

[8]The 1998 TRW marketing brochure for BCIS claims that BCIS has the ability via a digital data link to pass front-line situational awareness data across the battlefield and to provide a short–range supplement to the Tactical Internet. Personnel in the BCIS Product Office stated that funds have been obligated to link BCIS target identification data together with Force XXI Battle Command Battalion/Brigade and Below System situational awareness data.

[9]The Army conducted the testing in FY 1997, using Light Assault Vehicles.

[10]The Army tested the BCIS in numerous other military demonstrations and exercises in the past 7 years with earlier BCIS configurations.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
7. Compatibility with traditional allies.	NO	YES	YES[11]	NO[12]
8. Engagement process will not change with the addition of BCIS to the platform.	NO	YES	YES	YES
9. BCIS must operate in the Standard Army Maintenance System using standard tools and Test, Measurement, Diagnostic Equipment.	*2.0[13]*	*YES*	*YES*	*YES*
10. Reduce fratricide.	*1.0 [14]*	*YES*	*YES*	*YES*
11. BCIS for mid- and far-term shall provide integrated TI and SA.[15]	NO	YES	YES	NO[16]
12. Near-term BCIS will use Global Position System.	NO	YES	YES	YES
13. Near-term BCIS shall provide TI of friendly ground and airborne platforms to include dismounted soldiers, in ground–to-ground, air-to-ground (rotary wing), ground-to-air (rotary wing), and air-to-air (rotary wing) missions.	NO	PARTIAL[17]	YES	PARTIAL[18]

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[11]The Army used BCIS in a European demonstration on allied tanks.

[12]For the initial operational test and evaluation, the Army will not used the actual allied platforms. Instead, it will use allied platforms consisting of target silhouettes with BCIS mounted to them.

[13]Critical Operational Issue Criterion 2.0 asks whether BCIS equipped support units achieve and maintain training and maintenance standards within existing training and logistic systems?

[14]Critical Operational Issue Criterion 1.0 asks if BCIS equipped units have reduced fratricide rates and improved target identification of friendly forces without degrading unit combat effectiveness?

[15]The Army does not have research, development, testing and evaluation funds for testing or further integration of this requirement after FY 2001, according to the BCIS September 2000 R-2 form.

[16]The Army will not test BCIS with a situation awareness device in an operational test until FY 2004, approximately 18 months after the planned full-rate production decision.

[17]The Army tested early BCIS prototypes on rotary and fixed-wing aircraft and plans to test low-rate initial production BCIS units on ground vehicles and not on rotary and fixed-wing aircraft.

[18]The Army plans to operationally test only the M1A1D Tanks and M2 Bradley Fighting Vehicles (Operation Desert Storm variants), and high mobility multi-purpose wheeled vehicles.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
14. BCIS shall then automatically integrate and correlate SA (friendly and enemy position location) as reported through command and control systems, with through-sight or target designation/acquisition device TI.	NO	YES[19]	YES[20]	NO[21]
15. SA performance shall be as stated in Global Position System, Enhanced Position Location Reporting System and other related requirement documents.	NO	YES	YES	YES
16. Near-term TI provide 0.90 (threshold) and 0.99 (objective) probability of correct identification, <u>under all battlefield conditions</u> of targets not identified by other means for friendly ground (mounted/dismounted) and air platforms equipped with BCIS. Objective system shall provide this same reliability for friendly fixed wing aircraft, enemy, neutrals, and noncombatants.	**1.2.1[22]**	**YES**	**YES**	**PARTIAL[23]**

[19]Situational awareness integration is ongoing with Force XXI Battle Command Battalion/Brigade and Below System; however, through-sight situational awareness is still in the science and technology phase of development.

[20]Science and technology projects are undergoing developmental tests and, if successful, will require substantial funding to mature.

[21]The initial operational test and evaluation does not assess situational awareness products with the BCIS. Consequently, the Product Manager, Combat Identification, plans to test science and technology projects to assess situational awareness with the BCIS in a proposed follow-on operational test and evaluation in FY 2004. However, the TEMP does not address the proposed follow-on operational test and evaluation.

[22]Critical Operational Issue Criterion 1.2.1 states that BCIS operator must attain 90 percent (threshold) and 99 percent (objective) probability of correct identification of friendly platforms under each set of battlefield and weather conditions (such as smoke, electronic warfare, and fog) which allows BCIS host to engage target not identified by other means, while moving and static, at ranges and separations specified in the ORD for the BCIS.

[23]The Army operationally tested a pre-production prototype of the BCIS in artic conditions and plans to developmentally test a production prototype in artic conditions. However, the Army plans to only operationally test a production prototype BCIS in basic and hot climates in clear and dusty conditions and to operationally simulate the BCIS in fog, rain, and snow conditions.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
17. TI process shall be accomplished in parallel with the current engagement procedures and in less than one second (threshold).	**1.2.2**[24]	**YES**	**YES**	**YES**
18. BCIS provide TI and system status to both the platform/aircraft commander (TC) and gunner/operator (OPR) at the primary weapon sights or target designation/acquisition device.	*NO*	*YES*	*YES*	*YES*
19. Indications shall be visual and audible to gunner/operator.	*NO*	*YES*	*YES*	*YES*
20. Identification initiation process shall be automatic and fully integrated into the targeting process.	*NO*	*YES*	*YES*	*YES*
21. Indication mode shall be operator selectable (with the option to bypass one or the other in order to promote operational security) (threshold).	NO	YES	YES	YES
22. Discriminate between potential targets that are angularly separated by $\pm$ 22.5 mils (threshold).	**1.2.1**[25]	**YES**	**YES**	**YES**
23. BCIS must discriminate between potential targets, identified by small arms or crew served weapons that are angularly separated by $\pm$ 50 mils (threshold).	1.2.1[26]	NO	NO	NO

[24]Critical Operational Issue Criterion 1.2.2 states that BCIS interrogator-equipped platforms must not increase engagement time in an intermingled scenario (friend and foe) when compared to engagement times of like systems not equipped with BCIS in a like intermingled scenario.

[25]Critical Operational Issue Criterion 1.2.1 states that the BCIS operator must attain 90 percent (threshold) and 99 percent (objective) probability of correct identification of friendly platforms under each set of battlefield and weather conditions (such as smoke, electronic warfare, and fog) which allows BCIS host to engage target not identified by other means, while moving and static, at ranges and separations specified in the ORD for the BCIS.

[26]See footnote 25. BCIS operational test plans address only ground vehicle to ground vehicle capabilities.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
24. The system integrated into aviation platforms (helicopter) must correctly identify potential ground targets at 8 kilometers separated laterally by $\pm$175 meters and $\pm$133 meters in range; at 5 kilometers separated laterally by $\pm$105 meters and $\pm$83 meters in range.	1.2.1[27]	NO	NO	NO
25. In conjunction with other SA devices, BCIS must also discriminate between targets separated in range by 500 meters (threshold) and 100 meters (objective).	1.2.1[28]	YES	YES	NO
26. Provide automatic identification from transponder regardless of the aspect angle (threshold).	NO	YES	YES	YES
27. Identify (near-term interrogate and respond) with both systems static, one moving and one static, and both systems on the move (threshold).	1.2.1[29]	YES	YES	YES

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[27]Critical Operational Issue Criterion 1.2.1 states that the BCIS operator must attain 90 percent (threshold) and 99 percent (objective) probability of correct identification of friendly platforms under each set of battlefield and weather conditions (such as smoke, electronic warfare, and fog) which allows BCIS host to engage target not identified by other means, while moving and static, at ranges and separations specified in the ORD for the BCIS.

[28]See footnote 27. BCIS operational test plans do not address the situational awareness capability. The BCIS Product Office has no future research and development funds to integrate situational awareness technologies with BCIS.

[29]Critical Operational Issue Criterion 1.2.1 states that the BCIS operator must attain 90 percent (threshold) and 99 percent (objective) probability of correct identification of friendly platforms under each set of battlefield and weather conditions (such as smoke, electronic warfare, and fog) which allows BCIS host to engage target not identified by other means, while moving and static, at ranges and separations specified in the ORD for the BCIS.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
28. Provide identification, under all battlefield and weather conditions, which could permit the BCIS host to engage a target. As a minimum, under clear conditions, BCIS must identify out to the host system's maximum effective range multiplied by 1.5.	**1.2.1**[30]	**YES**	**YES**	**YES**[31]
29. Process a minimum of three near-simultaneous identifications (near-term interrogations or responses) in less than one second (threshold).	**NO**	**YES**	**YES**	**YES**
30. For use in the dismounted role, devise shall conform to the Enhanced Integrated Soldier System weight budget (threshold), less than one pound (objective).	NO	NO	NO	NO
31. Operate on and within the host platform power budget of any U.S. system, with backup of standard issue batteries for emergency, dismounted operations, or allied force usage.	NO	YES	YES	YES
32. When batteries are used, BCIS must be capable of at least a combination of 48 inquiries and/or responses, and 24 hours of continuous monitoring (threshold).	*NO*	*YES*	*YES*	*YES*
33. Incorporate self test (threshold).	NO	YES	YES	YES
34. Incorporate built-in test (threshold).	NO	YES	YES	YES
35. Incorporate built-in test equipment (objective).	NO	YES	YES	YES
36. Meet weight, space, and cube so that neither exceed host system design limitations nor decrease the transportability/mobility of the host system (threshold).	NO	YES	YES	YES

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[30]See footnote 23. BCIS will not be operationally tested in a cold climate and simulated in weather conditions. The ORD states that BCIS must operate in a hot, basic, and cold climatic design types. The Army is planning to use developmental testing data to evaluate the cold climate requirement.

[31]The Product Manager for Combat Identification plans to test BCIS in a basic and hot climate and in only clear and dusty conditions before the Military Deputy in-progress review and production milestone decision.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
37. Be reprogrammable in the field to allow input of new or changed signatures and identification decision parameters (objective). Code loading must be accomplished in less than one minute per device.	NO	YES	YES	NO
38. Possess embedded capability to encrypt/decrypt or encode/decode using National Security Agency (NSA) approved techniques with existing communication security equipment (threshold) or experimental techniques applicable to NSA certification criteria (objective).	NO	YES	YES	YES
39. Include safeguards against use through a single action to perform all required zeroization or memory destruction if captured by enemy forces (threshold) or through an automatic zeroing out or internal meltdown if there is an attempt at unauthorized removal (objective).	*NO*	*YES*	*YES*	*YES*
40. Incorporate modularity of major functional elements (such as input, output, SA and TI) to ensure integration without duplication of subsystems (threshold).	NO	NO	NO	NO
41. Provide visual and audible alarm (selectable on/off) in the event of abnormal power condition or impending system failure (threshold).	NO	YES	YES	YES
42. For question and answer devices, provide interrogated platform a visual and audible warning that it is being queried, with the option of selecting indicator mode or deactivating the warning. If a transponder is used, the response must be encoded to include the identification of the interrogation signal it is responding to (threshold).	NO	YES	YES	YES
43. Provide a selector capable of turning system to off, respond only, or inquire/respond (threshold).	NO	YES	YES	YES

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
44. BCIS must be capable of operating continuously 24 hours per day with a Mean-Time Between Failure of 1,242 hours (threshold) and 2,760 hours (objective).	**NO**	**YES**[32]	**YES**	**NO in Initial Operational Test**
45. Organizational level repair Mean Corrective Maintenance Time must be no greater than 15 minutes and a Maximum Corrective Maintenance Time no greater than 60 minutes. The intermediate direct support level Maximum Corrective Maintenance Time must be no greater than 30 minutes. Preventive maintenance will not exceed 5 minutes. The system must be supportable and repairable using standard tools and accessories in existence at the time of fielding and throughout its operational life.	NO	YES	YES	YES
46. Must be resistant to shock and vibration commensurate with other items located on the host platform.	*1.2.3*[33]	*YES*	*YES*	*YES*
47. BCIS components mounted externally on the host platform shall also be ballistic hardened commensurate with other external components (threshold).	*1.2.3*[34]	*NO*	*YES*	*YES*

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[32]Product Manager, Combat Identification, has no research, development, testing and evaluation funds forecasted beyond FY 2001 for increasing BCIS reliability via reliability growth testing strategy. Reliability Development/Growth Testing is a systematic engineering process of test-analyze-fix-retest where equipment is tested under actual, simulated, or accelerated environments. The objective of the BCIS Reliability Development/Growth Test, scheduled from November 2000 to April 2001 (FY 2001), is to obtain 70 percent confidence that reliability satisfies the ORD. The final results, according to Army Test and Evaluation Command, will not be presented at the Military Deputy in-progress review, only interim results.

[33]Critical Operational Issue Criterion 1.2.3 states that BCIS must resist ballistic impact, shock, and vibration commensurate with other items similarly mounted on host platforms.

[34]See footnote 33.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
48. No more detectable by threat forces than existing systems on host platform (threshold).	**1.2.4[35]**	**YES**	**YES**	**YES[36]**
49. Must not enhance the enemy's ability to locate and detect friendly forces from either greater standoff ranges or by unique signatures that can be detected by enemy forces (objective).	1.2.4[37]	NO	NO	NO[38]
50. BCIS will not interfere with, nor be interfered by, other electronic equipment located on or near the host system (threshold).	NO	YES	YES	YES
51. BCIS must be hardened against directed energy (laser and radio frequency) weapons and countermeasures (objective).	NO	NO	NO	NO
52. Protected against effects of Nuclear, Biological and Chemical contamination and decontamination agents.	NO	YES	YES	YES
53. Resupply by personnel wearing Mission Oriented Protective Posture IV clothing (threshold).	NO	YES	YES	YES
54. Include a Wartime Reserve Mode capability (objective).	NO	NO	NO	NO
55. BCIS must not interfere with the ability of its host platform to be transported tactically or strategically using military or commercial modes (threshold).	NO	YES	YES	YES

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[35]Critical Operational Issue Criterion 1.2.4 states that BCIS platform(s) must be no more detectable/susceptible (vehicle–electronic signature, in signal saturated areas, and to electronic countermeasures) than existing systems on host BCIS platforms.

[36]The Army will evaluate the BCIS against enemy sensors from April through May 2001, as well as previous test results from earlier versions of the BCIS that the Army deems relevant to the current version of the BCIS.

[37]Critical Operational Issue Criterion 1.2.4 states that BCIS platform(s) must be no more detectable/susceptible (vehicle-electronic signature, in signal saturated areas, and to electronic countermeasures) than existing systems on host BCIS platforms.

[38]The Army plans to use analysis to assess only whether BCIS equipped units are more detectable by threat forces. Earlier independent testing evaluations determined that earlier configurations of the BCIS were not detectable.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
56. BCIS or its components shall be interoperable and/or compatible with other platforms for coalition use, using standard issue batteries when required (threshold).	**NO**	**YES**	**NO**	**NO[39]**
57. Crews will perform operator level maintenance.	NO	YES	YES	YES
58. Organizational maintenance will be performed by organic maintainers.	NO	YES	YES	YES
59. Direct support and depot maintenance will be performed by electronic maintainers.	NO	YES	YES	YES
60. Unit level maintenance will perform on-site repair by removal and replacement of Lowest Replaceable Unit.	NO	YES	YES	YES
61. BCIS mid- and far-term will take place at Training and Doctrine Command schools with unit training programs providing a sustained base of knowledge. BCIS will be included in Conduct-Of-Fire Trainer training, aviation simulators, Simulation Network System, and will be utilized in major training events and field training exercises.	*2.2.1[40]*	*YES*	*YES*	*YES*
62. BCIS will not present any electrical, optical, or other types of hazards to humans.	NO	YES	YES	YES
63. (Paragraph 5.d.) BCIS shall provide soldier-computer interfaces incorporating features which facilitate interactive operator control, information entry/output/display, an input validation and error checking.	NO	YES	YES	YES

[39]The BCIS has been demonstrated on other European tanks, but will not be operationally tested on an allied platform.

[40]Critical Operational Issue Criterion 2.2.1 states that BCIS-equipped units and BCIS support units must be capable of safely training personnel to perform all critical tasks in accordance with the Doctrinal and Organizational Test Support Package and Training Test Support Package.

BCIS Requirements	Critical Operational Issue	Resourced and or Funded	Developmental Test	Operational Test
64. BCIS processors should be based upon an open architecture to permit integration with other systems, such as position/navigation and SA devices and to readily accept upgrades.	NO	NO	YES	YES
65. BCIS must have the ability to encrypt and decrypt interrogation and reply commands if used.	NO	YES	YES	YES
66. Command, control, and communication networks will be required to disseminate SA information across the battlefield, including organizational boundaries. This will permit correlation of SA and TI.	NO	YES	YES	NO[41]

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[41]Product Manager, Combat Identification, stated that the Army will test BCIS for correlation of situational awareness and target identification during the follow-on operational test and evaluation in FY 2004. The Army has not outlined or planned for the proposed follow-on operational test and evaluation in the approved or the draft TEMP.

Appendix E. Audit Response to Army Comments Concerning the Report

Our detailed responses to the comments from the Deputy for Systems Management and Horizontal Technology Integration (the Deputy), Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), on statements in the draft report follow. The complete text of those comments is in the Management Comments section of this report.

Management Comments on the Overall Report and Audit Response

Management Comments Addressing the Overall Report. The Deputy provided comments on the overall report and stated that the Army has a viable, deliberate acquisition strategy for BCIS authorized by the Army Systems Acquisition Review Council and the milestone decision authority and reviewed by the Defense Acquisition Executive. Further, the Deputy stated that the Army acquisition strategy is to conduct the initial operational test and evaluation during the summer of FY 2001 based on an updated, approved ORD and TEMP; to use the results of the initial operational test and evaluation to determine funding for the BCIS in the Program Objective Memorandum for FY 2004 through FY 2009, submitted in May 2002; and to conduct the full-rate production decision review in June 2002, based on the initial operational test and evaluation and available funding. The Deputy concluded that this strategy will enable a competitive acquisition phase for full-rate production.

Audit Response. The Army Systems Acquisition Review Council and the milestone decision authority authorized the acquisition strategy for the BCIS after the Deputy Director, Army Program Analysis and Evaluation Directorate, stated that:

- the BCIS was unaffordable for low-rate initial production;

- he could not support incremental funding of the BCIS for only the 4th Infantry Division; and

- the BCIS had a funding shortfall of $2 million for procurement of the low-rate initial production units from FY 2000 through FY 2002; a shortfall of $183 million for full-rate production from FY 2000 through FY 2005; and a funding shortfall of $3.7 million from FY 2002 through FY 2005 for operations and maintenance, including reparables, consumables, post-production software support, and replacement training.

The acquisition strategy that the Army Acquisition Executive presented to the Defense Acquisition Executive was for a three-phase procurement of 1,169 BCIS units for the 4th Infantry Division without full funding for the Army procurement objective of 16,414 units. The Army Acquisition Executive told

the Defense Acquisition Executive about BCIS uncertainties with reliability and interaction with situation awareness and stated that, if the Army decided to increase the BCIS procurement, it would be with a restructured acquisition program baseline and adequate funding.

The Army should not be using the results of the initial operational test and evaluation to determine funding. The purpose of initial operational test and evaluation is to determine whether systems are operationally effective and suitable for intended use by representative users to support the decision to proceed beyond low-rate initial production. Further, the acquisition strategy is not the roadmap to acquire program funding. As discussed in DoD Regulation 5000.2-R, the acquisition strategy is the roadmap for program execution from program initiation through post-production support and includes the critical events that govern the management of the program. The primary goal of the acquisition strategy is to minimize the time and cost of satisfying an identified, validated need consistent with common sense and sound business practices. The process for acquiring program funding is the planning, programming, and budget system.

Concerning the full-rate production decision in June 2002, DoD Regulation 5000.2-R requires the milestone decision authority to assess affordability at each milestone decision point beginning with program initiation. Further, the Regulation requires that the milestone decision authority not approve an acquisition program to proceed beyond program initiation unless sufficient resources, including staffing, are programmed in the most recently approved Future Years Defense Program or will be programmed in the next Program Objectives Memorandum, Budget Estimate Submission, or President's Budget. Therefore, the Army Acquisition Executive should not allow the BCIS to proceed into full-rate production unless the system is operationally effective and suitable, based on the initial operational test and evaluation results using an approved, updated ORD and TEMP, and fully funded for the Army procurement objective of 16,414 units to fully meet the user needs to minimize fratricide on the battlefield.

Management Comments on Finding A and Audit Response

Management Comments Addressing the Overall Finding. The Deputy nonconcurred with the finding and commented on the viability of the acquisition strategy for the BCIS and the implementation of the third phase of low-rate initial production.

     Acquisition Strategy. The Deputy reiterated his comments to the overall report and disagreed that the Army did not have a viable acquisition strategy to acquire the BCIS at the completion of the engineering and manufacturing development phase. The Deputy stated that the Army had an approved acquisition strategy for the BCIS that is balanced, practical, and prudent considering the funding constraints, the need to validate the reliability of early production BCIS hardware, and the need to assess the operational contribution of BCIS to situational awareness. Further, the Deputy stated that, on July 30, 1999, the Army Acquisition Executive approved the BCIS

acquisition strategy that details the schedules, contracting plans, testing plans, and milestone decision reviews required to enable the BCIS to proceed from the engineering and manufacturing development phase through the full-rate production and pre-planned product improvement phases. He stated that the program funding shows a deliberate decision by the Army to procure BCIS initially to equip only the 4th Infantry Division at Fort Hood, Texas. The Deputy continued by reiterating the following statements that we made in the finding.

- the Army Systems Acquisition Review Council review of the BCIS for low-rate initial production;

- the three-phased approach for low-rate initial production to equip the 4th Infantry Division;

- the acquisition decision memorandum authorizing the award of low-rate initial production contracts for first phase in FY 1999 and the second phase in FY 2000;

- the in-process review and associated requirements, including system performance and reliability ; and

- the letter to the Under Secretary of Defense for Acquisition, Technology, and Logistics, explaining the Army's rationale for limiting procurement of the BCIS to the 4th Infantry Division.

Further, the Deputy stated that the Army was continuing to execute the program that the Army Systems Acquisition Review Council and the Army Acquisition Executive authorized. He stated that the Army plans to complete final testing of system reliability and initial operational test and evaluation in the summer of 2001. Plans also include a production commitment decision in the third quarter of FY 2002 to support a competitive acquisition phase for full-rate production. The Deputy concluded that this approach allows the Army to effect funding for FY 2004 and beyond to support a rationalized full-rate production program.

Audit Response. Without determining whether BCIS is affordable and having a commitment from the Army to fully fund the BCIS, the Army will have expended additional funds with no assurance the program will receive full funding. If the Army later determines that the program is unaffordable, the Army will have squandered scarce resources.

Third Phase of Low-Rate Initial Production. The Deputy stated that the Army considered that a delay in implementing the third phase of the low-rate initial production would be unnecessary in view of the decisions and actions by the Army Systems Acquisition Review Council and the Army Acquisition Executive; therefore, the Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) convened the in-process review on February 20, 2001. Further, the Deputy stated that, based on the presentations by the Product Manager, Combat Identification, and the representatives from the user community, the independent test community, the training community, the program offices for major platforms that will receive the BCIS, and the unanimous recommendation by the Army Headquarters Overarching Integrated

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Product Team, the Military Deputy concluded that the BCIS had met the requirements for the in-process review. He also granted approval for the BCIS to implement the third phase of low-rate initial production after the reliability development growth test that was in process was completed.

Audit Response. Without an updated and approved TEMP and ORD to verify BCIS system performance and reliability, and without completing the reliability development growth test and obtaining the results, we question how the attendees at the in-process review concluded that the BCIS had met the requirements; for example, one of the requirements is to verify whether the BCIS meets system performance and reliability requirements. Further, the Military Deputy should not have approved entrance into the third phase of the low-rate initial production until the Army programmed full funding, as required by DoD Regulation 5000.2-R and Army Pamphlet 70-3.

Management Comments on Finding B and Audit Response

Management Comments Addressing the Overall Finding. The Deputy concurred with the finding and commented on the TEMP approval, the lack of environmental testing, and the risk of producing a system that will not meet user needs.

TEMP Approval. The Deputy agreed that the approved TEMP was the 1993 version developed for the milestone decision review to approve the BCIS entering engineering and manufacturing development. The Deputy acknowledged that the TEMP should be updated to incorporate changes in the BCIS since 1993 and to comply with policy changes that have already occurred. Further, the Deputy stated that a BCIS Test Working-Level Integrated Product Team began work in the second quarter of FY 1999 to complete the BCIS test program and to update the TEMP, which the Army will complete and approve in early July 2001, before the initial operational test and evaluation begins in the fourth quarter of FY 2001. The Deputy concluded that the test program in the updated TEMP will enable the independent tester to address BCIS operational requirements and assess the system's suitability, effectiveness, and survivability.

Audit Response. We updated the report to show the revised dates for approving the TEMP and for conducting the initial operational test and evaluation.

Environmental Testing. The Deputy commented on the lack of environmental testing by stating that the Army will rely on data from developmental tests performed over the life of the program, including verifying production hardware performance in environmental extremes during the reliability development growth test, as well as supplemental modeling and simulation.

Audit Response. The BCIS goal is to reduce the risk of fratricide by identifying BCIS-equipped targets under all battlefield conditions, including degraded environmental conditions, such as smoke, darkness, rain, dust and fog. In FY 2001, under Army Test and Evaluation Command oversight, the

contractor will conduct developmental testing of a BCIS production prototype to evaluate BCIS performance in cold climates; however, the Army does not plan to conduct operational testing of a production prototype in a cold climate. Further, according to the Product Manager, the Army will operationally test BCIS only in the basic to hot climates under dusty and clear conditions. None of the developmental or operational tests will test the BCIS in fog, snow, or rain. Consequently, the Army Test and Evaluation Command plans to use a model to simulate fog, snow, and rain to evaluate BCIS capabilities in those environments. If the Army does not operationally test the BCIS in fog, snow, or rain before entering full-rate production, it cannot be assured that it is fielding a system that fully meets user needs to reduce fratricide. If later tests and actual combat applications show that BCIS production units are not effective in those environments, the Army will have to obtain additional scarce Army funds to modify the production units to correct those limitations.

User Needs. The Deputy stated that, given the closeness to completion, the Army disagrees that an increased risk exists in producing a system that will not fully meet user needs because of the lack of an updated TEMP and ORD. Further, the Deputy stated that the updated TEMP is near approval and that the Army Training and Doctrine Command (TRADOC) has updated the ORD with Army approval expected in April 2001. The Deputy also stated that the Army is satisfied that the requirements in the updated ORD and the test program in the updated TEMP will provide the testers with an adequate basis for determining whether the production hardware fully meets user needs. Further, the Deputy stated that BCIS performance, except for reliability, has never been an issue; it was always as good or better than the ORD requirement. The Deputy concluded that the Army has substantiated the reliability or the mean-time between failure of the stable BCIS configuration in demonstrations and tests, culminating in the reliability development growth test, which concludes in March 2001.

Audit Response. Even though approval of the updated ORD and TEMP may be imminent, that does not mean that previous tests, including the reliability development growth test, based on the 1993 versions of the ORD and TEMP meet the operational requirements of the updated ORD and TEMP. Further, we question how the BCIS performance has never been an issue after considering the following concerns:

- The April 1993 ORD did not contain key performance parameters and the Director for Command, Control, Communications, and Computers and the Director, Defense Information Systems Agency, identified deficiencies in the defined interoperability requirements for use in determining system performance through testing.

- The Army did not plan a joint operational test to ensure that the BCIS was compatible with Air Force, Navy, Marine Corps, and allied vehicle platforms. Instead, the Army planned to conduct a force-on-force evaluation simulation using the Combined Arms and Support Task Force Evaluation model to determine ground-vehicle fratricide rates. This model will simulate warfighting scenarios for ground forces; however, the TEMP does not describe the scenarios involving the BCIS.

- The Army does not plan to operationally test the BCIS with the Force XXI Battle Command Battalion/Brigade and Below System until FY 2004 to determine whether they work in concert to reduce fratricide. Further, the ORD and the C^{4}I Support Plan require that the BCIS be able to provide target identification information to situational awareness systems. The Product Manager funded efforts to develop a link between the BCIS and the Force XXI Battle Command Battalion/Brigade and Below System situational awareness system. However, the planned initial operational test and evaluation in the fourth quarter of FY 2001 will not test or evaluate the link to determine how effectively the BCIS passes target identification data to the Force XXI Battle Command Battalion/Brigade and Below System. Instead, the Product Manager, Combat Identification, plans to rely on a follow-on operational test and evaluation in FY 2004, funded by the Army Test and Evaluation Command, to determine whether the BCIS and the Force XXI Battle Command Battalion/Brigade and Below System work in concert to reduce fratricide.

- Under Army Test and Evaluation Command oversight, the contractor will conduct developmental testing of a BCIS production prototype to evaluate BCIS performance in cold climates in FY 2001; however, the Army does not plan to conduct operational testing of a production prototype in a cold climate. Further, according to the Product Manager, the Army will only operationally test BCIS in the basic to hot climates under dusty and clear conditions. None of these developmental or operational tests will test the BCIS in fog, snow, or rain. Consequently, the Army Test and Evaluation Command plans to use a model to simulate fog, snow, and rain to evaluate BCIS capabilities in those environments.

- During the initial operational test and evaluation, the Army will limit the BCIS operational test to using only Abrams Tanks and Bradley Fighting Vehicles as host vehicles against gunnery range target silhouettes, with BCIS bolted on to both the host vehicles and target silhouettes. Additionally, during the developmental test in FY 2001, the Army will conduct a product verification test using the High Mobility Multipurpose Wheeled Vehicle for reliability data. The Army has more than 20 different vehicle platforms that will host the BCIS. Operational testing on only two platforms, the Abrams Tank and the Bradley Fighting Vehicle, and developmental testing using the High Mobility Multipurpose Wheeled Vehicle will not realistically represent the battlefield environment. Therefore, the Army will have incomplete test results concerning the utility of the BCIS on all vehicles in an Army division before the planned production decision.

- The Army Acquisition Executive expressed concern over the uncertainties about BCIS reliability and interaction with situational awareness in his letter to the Defense Acquisition Executive (see Appendix C).

Concerning reliability or the mean-time between failure, the Army had not substantiated through operational testing BCIS reliability and supportability to meet the current requirement to operate continuously for 24 hours per day, with a threshold mean-time between failure rate of 1,242 hours. As of March 2001, the Army was conducting reliability growth testing at the contractor's facility to test BCIS reliability in a laboratory environment. Direct comparisons of how BCIS performs in an operational environment may greatly differ.

Management Comments Addressing the Main Body of the Report and Audit Response

Management Comments Addressing the Main Body of the Report. The Deputy provided additional facts and clarifications on addressing the background; full funding for the program; ORD key performance parameters; ORD certification for interoperability; planned operational tests to address all BCIS operational requirements; realistic testing of operational requirements; platform vulnerability to detection; situational awareness linkage; Appendix D, BCIS Operational Requirements 2, 3, 5, 7, 16, 23, 24, 30, 37, 44; and Appendix D, Footnote 51.

Background. The Deputy provided additional background information describing how the BCIS operates.

Audit Response. We revised the report to include the additional background information.

Full Funding. The Deputy recommended removal of the statement "without requiring the Product Manager to obtain full funding for the program" from the report because prioritization and funding decisions for Army acquisition programs are under the purview of Army Headquarters staff. The Deputy stated that the Product Manager has consistently requested full funding for the BCIS; however, the Army has not approved full funding to date.

Audit Response. We revised the report to state, "without ensuring that the Army had fully funded the program."

ORD Update. The Deputy did not agree that the TRADOC System Manager failed to update the ORD in accordance with new guidance requiring key performance parameters. The Deputy stated that the Army issued policy guidance for this requirement effective June 2000. Further, he stated that the TRADOC System Manager updated the ORD, to include the key performance parameters and cost data, on December 26, 2000, and that he expected approval of the ORD by April 2001.

Audit Response. We agree that the Army took action to update the ORD; however, the ORD was still in draft and not approved. The Director for Command, Control, Communications, and Computers (J-6), and the Director, Defense Information Systems Agency, had substantial comments on corrections that the TRADOC System Manager must complete before the Directors certify the ORD for Army approval. Unless the BCIS operational testers use the draft

updated ORD, which has key performance parameters, the operational tests will not test against any key performance parameter because the 1993-approved ORD did not contain key performance parameters.

ORD Certification. The Deputy agreed that the Director for Command, Control, Communications, and Computers (J-6), has yet to certify the ORD for interoperability. However, the Deputy stated that the report should indicate that the updated ORD includes an interoperability key performance parameter and that the TRADOC System Manager has taken action to achieve the required J-6 certification.

Audit Response. The issue was not just that the Director for Command, Control, Communications, and Computers (J-6) had not yet certified the ORD for interoperability and that the TRADOC System Manager had not taken action to achieve the required J-6 certification, but that the operational testers must test and evaluate the BCIS against the key performance parameters in the updated ORD to assess the system's suitability and effectiveness. As of March 2001, the Director for Command, Control, Communications, and Computers (J-6), and the Director, Defense Information Systems Agency, had yet to receive corrections from the TRADOC System Manager in order for the Directors to certify the ORD for interoperability. However, if the Army does not obtain an updated and approved ORD and TEMP before the initial operational test and evaluation in the fourth quarter of FY 2001, the BCIS testers cannot test and evaluate the system using updated operational requirements to ensure that BCIS fully meets user needs.

Planned Operational Tests. The Deputy stated that the report incorrectly stated that, "The BCIS Product Manager did not ensure that planned operational tests addressed all BCIS operational requirements. Specifically, planned tests did not address requirements for operating in all environments, Service compatibility, system reliability and supportability, platform vulnerability to detection, and situational awareness linkage." Further, the Deputy stated that the Product Manager, Combat Identification, had consistently worked closely with the BCIS testers to ensure a comprehensive operational test and that the Army Test and Evaluation Command was responsible for decisions concerning the scope of the operational testing, the test methodology, and assessment of the test results. The Deputy also stated that the Army was satisfied that the BCIS test strategy, which the BCIS Test Working-Level Integrated Product Team developed, will adequately address the concerns noted in the audit report.

Audit Response. As of March 2001, the Army still did not plan to operationally test the BCIS in the following areas:

- linkage to situational awareness, which the Army has maintained is an element necessary to reduce fratricide;

- cold, fog, snow, and cold environments. The Deputy stated that the Army is relying on developmental tests and supplemental modeling and simulation data;

- interoperability with other Service or allied platforms; and

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- reliability and supportability will not be tested to the BCIS requirement of operating continuously 24 hours per day, with a threshold mean-time between failure rate of 1,242 hours. Reliability had only been tested in a technical environment as of March 2001.

Therefore, direct comparisons of how the BCIS performs in an operational environment may greatly differ. Additionally, the Army has not adequately determined how it will logistically support the BCIS in the field. The logistic support concept in the 1993 ORD was for BCIS components to be directly exchanged from the contractor to the platform. Based on the threshold reliability requirement in the approved 1993 ORD, the BCIS will fail after about 52 days of operation,[*] when the system reliability is at 100 percent of the requirement. Consequently, the Army should have a supply of spare components dedicated as replacements for failed components. The Product Manager, Combat Identification, had not budgeted for the procurement of components as spares in out-year budget requests.

Realistic Testing. The Deputy did not agree with the conclusion that testing will not be representative of the battlefield environment. The Deputy stated that the Abrams Tank and Bradley Fighting Vehicle, or their variants, constitute the majority of the combat-shooter platforms scheduled to be equipped with the BCIS. Further, the Deputy stated that the High Mobility Multipurpose Wheeled Vehicle and its variants comprise the remainder of the shooter systems and a significant portion of the non-shooter platforms to be equipped with BCIS. The Deputy also stated that resource constraints make it cost prohibitive to operationally test BCIS on every variant of every host platform before production.

Audit Response. In the 1993 ORD, the combat developer's requirements were clear about interoperability and compatibility, noting that, "This is a critical characteristic because of the need to provide our warfighting allies with a device that will reduce the risk of fratricide between U.S. and allied forces." The 1993 ORD also stated that, "The modern battlefield requires a device which requires the capability to positively identify friendly forces among a mix of allied, coalition, and U.S. units at distances beyond a system's maximum effective range." The resulting 1993 TEMP addressed resources for multi-platforms to evaluate the BCIS effectiveness in reducing fratricide that included many vehicles, including rotary-winged platforms, to host the BCIS.

In the fourth quarter of FY 2001, the Army plans to install and operationally test BCIS on Abrams tanks, the Bradley Fighting vehicles, and the High Mobility Multipurpose Wheeled Vehicles and their variants; however, the Army plans only to install and not operationally test BCIS on other platforms such as the artillery, engineer, and new interim armored vehicles. The Army should

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[*]We calculated the 52 days by dividing 1,242 hours by 24 hours of continuous operation. The Product Manager stated that the BCIS is expected to support the ORD at the 70 percent confidence level. Therefore, the mean-time between failure occurring will be more often than 52 days. The Army strategy is to improve reliability over time; however, the Army does not have research, development, test, and evaluation funds to improve the system's reliability. System reliability becomes more critical if the Army decides that the BCIS is a mission-essential item. The approved ORD states that BCIS is not mission essential; therefore, system replacement will not be a priority.

include those platforms in the initial operational test and evaluation in the fourth quarter of FY 2001 to ensure that all vehicles equipped with the BCIS system configuration provide 360-degree coverage. Furthermore, BCIS does not provide the optimum solution envisioned by the 1993 ORD. The result of the downsized test and not addressing all the requirements is the "getting something is better than nothing" philosophy to the warfighter, which has unknown consequences for how the system interacts with all vehicles in battlefield conditions.

Further, the BCIS will not resolve the kinds of fratricide incidents that occurred in Operation Desert Storm in 1991 between friendly units and with rotary-wing platforms and allied troops because:

- the Army plans to procure only 1,169 BCIS units for selective vehicles in the 4th Infantry Division instead of the Army procurement objective of 16,414 BCIS units, and

- the BCIS will not operate with rotary-wing platforms, such as the Apache helicopter, and with allied identification systems.

Platform Vulnerability. The Deputy recommended that the report paragraph addressing Army Test and Evaluation Command actions on platform vulnerability to detection be revised to read, "Under the current test strategy, U.S. Army Test and Evaluation Command plans to evaluate the potential increase in BCIS-equipped platforms to detection by enemy sensors. The evaluation will be based on analysis by the Survivability Lethality Analysis Directorate (SLAD) of results from planned vulnerability tests on the BCIS in the April-May 2001 timeframe, as well as previous test results from the earlier version of BCIS that are deemed relevant to the current version."

Audit Response. We revised the report concerning "Platform Vulnerability to Detection" as suggested.

Situational Awareness Linkage. The Deputy recommended that the statement concerning situational awareness be deleted, stating that BCIS interoperability with situational awareness is an objective requirement in the updated ORD and is not an issue for the in-process review or the full-rate production decision.

Audit Response. Until the Army approves the updated ORD and operationally tests the BCIS with the Force XXI Battle Command Battalion/Brigade and Below System to determine whether they work in concert to reduce fratricide, the situational awareness issue is still a concern. The Military Deputy to the Army Acquisition Executive testified twice before Congress on the issue of situational awareness; on both occasions, he stated that the Army was working hard on the situational awareness problem. If BCIS interoperability with situational awareness is now an objective requirement, the Army must specify how it will operationally test the BCIS to ensure that it is interoperable with other target identification systems to fix historic fratricide problems, such as air-to-ground incidents. Therefore, until different

technologies are available to enable the BCIS to be interoperable between platforms, the warfighter can expect fratricide to occur in a joint operational environment.

BCIS Operational Requirement 2. The Deputy recommended that Appendix D, Requirement 2, be changed to read "Yes" in the Resourced and Operational Test columns because the Army designed the current version of the BCIS for ground-to-ground, mounted operations only and will fully test that version against Requirement 2. Further, the Deputy stated that the Army was addressing the dismounted combat identification requirements and that the user was studying the rotary wing combat identification requirements.

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 3. The Deputy recommended that Appendix D, Requirement 3, be changed to read "Partial" in the Operational Test column. The Deputy stated that, during the initial operational test and evaluation and the follow-on operational test and evaluation, the Army will test representative and relevant military operations. However, the Deputy concluded that no feasible operational test could cover the entire "continuum of military operations."

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 5. The Deputy recommended that Appendix D, Requirement 5, be changed to read "Not Applicable" in the Operational Test column because the Army never envisioned the initial version of BCIS to be a far-term solution.

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 7. The Deputy recommended that the footnote concerning the operation test in Appendix D, Requirement 7, be changed to read, "There are no production combat identification systems from allies available for operational test. However, ATEC [the Army Test and Evaluation Command] plans to use realistic target silhouettes to test whether the BCIS will reduce fratricides in coalition warfare, especially involving non-traditional allies who may have equipment usually associated with hostile forces."

Audit Response. Using silhouettes does not address whether the BCIS technology is compatible with allied combat identification systems. Instead, the use of silhouettes tests only whether the operators can visually identify the targets and whether the BCIS transponder on the silhouette communicates with other transponders. Such a configuration does not assess the millimeter wave technology difference between the Army BCIS system and allied systems. The Army knows that the initial BCIS configuration is not interoperable with the allies' systems.

BCIS Operational Requirement 16. The Deputy recommended that Appendix D, Requirement 16, be changed to read "Yes" in the Operational Test column because the Army designed the initial BCIS configuration to attain a minimum of 90 percent probability of correct identification for ground-to-ground operations and will test to that criterion during initial operational test and evaluation. The Deputy stated that the Army will operationally test the objective requirement of 99 percent probability of correct identification in a follow-on test if it decides to make that requirement part of a BCIS pre-planned product improvement or block upgrade effort. Further, the Deputy stated that the part of the requirement relating to dismounted operations, and operations involving friendly fixed-wing aircraft and the identification of enemy, neutrals, and noncombatants, does not apply to the initial BCIS configuration.

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 23. The Deputy recommended that Appendix D, Requirement 23, be changed to read "Not Applicable" in the Resourced, the Developmental Test, and the Operational Test columns because this requirement applies to the Individual Combat Identification System that the Army developed under a separate ORD.

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 24. The Deputy recommended that Appendix D, Requirement 24, be changed to read "Not Applicable" in the Resourced, the Developmental Test, and the Operational Test columns because this requirement applies to a rotary wing-to-ground combat identification mission area and because the Army will address this requirement when it develops an ORD for that mission area.

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 30. The Deputy recommended that Appendix D, Requirement 30, be changed to read "Not Applicable" in the Resourced, the Developmental Test, and the Operational Test columns because this requirement applies to the Individual Combat Identification System that the Army developed under a separate ORD.

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 37. The Deputy recommended that Appendix D, Requirement 37, add a footnote to the Operational Test column to indicate that this requirement is an objective requirement, which the Army will operationally test in a follow-on test if the Army decides to make that a requirement as part of a pre-planned product improvement or a block upgrade effort.

Audit Response. Until the Army approves an updated ORD, the report is correct based on the April 1993 version of the ORD.

BCIS Operational Requirement 44. The Deputy recommended that Appendix D, Requirement 44, be changed to read "Yes" in the Operational Test column and that statements in the Operational Test column be deleted. The Deputy recommended the change because the production verification test included in the operational test is inappropriate because:

- the production verification test is developmental testing, and

- the comment in the report, which indicates that the Army will not collect reliability, availability, and maintainability data in the initial operational test and evaluation, was inaccurate.

Further, the Deputy stated that the Army plans to collect data on reliability, availability, and maintainability during the initial operational test and evaluation.

Audit Response. We revised Operational Test column in the report to state "No in Initial Operation Test" because the Army will not fully test the requirement, as discussed in the Deputy's comments.

Footnote 51. The Deputy recommended that Appendix D, Footnote 51 (renumbered as Footnote 37 in final report), be revised in accordance with his comments concerning situational awareness linkage. In those comments, the Deputy recommended that the statement concerning situational awareness in the report be deleted, stating that BCIS interoperability with situational awareness is an objective requirement in the updated ORD and is not an issue for the in-process review or the full-rate production decision.

Audit Response. The footnote addresses host platform vulnerability, not situational awareness linkage. However, based on the Deputy's comments concerning platform vulnerability, we revised the footnote from "NO" to "YES" and stated that the Army will evaluate the BCIS against enemy sensors from April through May 2001, and evaluate previous test results from earlier versions of the BCIS that the Army deems relevant to the initial version of the BCIS.

Appendix F. Report Distribution

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Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) Comments

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
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WASHINGTON, DC 20301-6000

MAR 13 2001

COMMAND, CONTROL,
COMMUNICATIONS, AND
INTELLIGENCE

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE
ATTN: DIRECTOR, ACQUISITION MANAGEMENT

SUBJECT: Audit Report on the Acquisition of the Battlefield Combat Identification System
(Project Number D2000AE-0210)

Your memorandum, January 21, 2001, requested review and comment for the subject proposed audit report. OASD(C3I) comments are attached.

The OASD(C3I) point of contact for this matter is Alan Lahoff, 703-607-0293, who is assigned to the Communications, Command and Control Directorate.

Robert M. Nutwell, RADM, USN
Deputy Assistant Secretary of Defense
(C3ISR & Space)

Attachment:
As stated

March 2, 2001

OASD(C3I)/C3 COMMENTS ON DRAFT OFFICE OF THE INSPECTOR GENERAL, DOD,
AUDIT REPORT: ACQUISITION OF BATTLEFIELD COMBAT IDENTIFICATION
SYSTEM

1. Page ii (as stated in draft report): "Summary of Recommendations. We recommend that the Army not allow the BCIS to continue with the third phase of low-rate initial production until the Army provides full funding for the production phase of the Program to meet user requirements and determines that the Program is affordable. Further, we recommend that the Army update and correct identified deficiencies in the BCIS Operational Requirements Document and Test and Evaluation Master Plan, and delay the in-process review scheduled for January 2001 until the Army completes testing and that the Director, Operational Test and Evaluation, designate BCIS for oversight."

   Response: Partially concur. Recommended delete ... "and delay the in-process review scheduled for January 2001 until the Army completes testing "

   Rationale: The January 2001 In-Process Review has been completed. No change to the BCIS LRIP decision resulted.

2. Page 9 (as stated in draft report): Recommendation A. "We recommend that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) not allow the Battlefield Combat Identification System to continue with the third phase of low-rate initial production until the Army provides full funding for the production phase of the program to meet user requirements and determines that the program is affordable."

   Response: Concur.

3. Page 17 (as stated in draft report): "B.1. We recommend that the Army Training and Doctrine Command System Manager for the Battlefield Combat Identification System update the operational requirements document for the Battlefield Combat Identification System before March 2001 to include corrected deficiencies that the Director for Command, Control, Communications, and Computers (J-6) and the Director, Defense Information Systems Agency identified."

   Response: Concur. We note that the Army is already updating the operational requirements document.

4. Page 17 (as stated in draft report): "B.2. We recommend that the Director, Operational Test and Evaluation, designate the Battlefield Combat Identification System for oversight, and review the updated Battlefield Combat Identification System test and evaluation master plan, detailed test plans, and operational test results before March 2001."

Response: Concur. We note that the Director, Operational Test and Evaluation has agreed to designate BCIS for oversight.

5. Page 17 to 18 (as stated in draft report): "B.3. We recommend that the Product manager, Combat Identification:

a. Update the test and evaluation master plan to accurately show current and future tests and evaluations, resource and schedule activities, and the test management strategy and structure as derived from updated operational requirements document for the Battlefield Combat Identification System."

Response: Concur. We note that the Army is already updating the BCIS Test and Evaluation Master Plan.

b. "Delay the January 2001 In-Process Review until the Army completes its testing as identified in the updated Battlefield Combat Identification System test and evaluation master plan before deciding on procurement of an additional 1,032 Battlefield Combat Identification System units for further low-rate initial production."

Response: Non-concur. Recommend this recommendation be deleted.

Rationale: The January 2001 In-Process Review has been completed. No change to the BCIS LRIP decision resulted.

Prepared by Alan Lahoff, OASD(C3I)/C3, 703-607-0293

Director, Operational Test and Evaluation, Comments

OFFICE OF THE SECRETARY OF DEFENSE
1700 DEFENSE PENTAGON
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9 MAR 2001

OPERATIONAL TEST
AND EVALUATION

MEMORANDUM FOR DIRECTOR, ACQUISITION MANAGEMENT DIRECTORATE,
DEPARTMENT OF DEFENSE INSPECTOR GENERAL

SUBJECT: Draft Audit Report on the Battlefield Combat Identification System
(Project No. D2000AE-0210)

This office has reviewed the draft subject audit report. I concur with all three recommendations addressing the Comprehensive Test Planning Strategy. These recommendations should be implemented as soon as practicable. DOT&E designated the Battlefield Combat Identification System for oversight in November 2000.

Please direct any questions to my POC for this system, COL Robin B. Sellers, 703-697-3891.

L. H. Frame
Acting Director

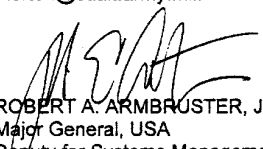# Department of the Army Comments

SAAL-SA

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: Audit Report of the Acquisition of the Battlefield Combat Identification System (Project No. D2000AE-0210)

The Army appreciates the opportunity to review and comment on the draft audit report on the Battlefield Combat Identification System (BCIS). Enclosed are management comments, as requested, including comments by this office, Product Manager for Combat Identification and the Training and Doctrine Command System Manager. The Army non-concurs with Finding A, concurs with Finding B, and non-concurs with the recommendation to delay implementation of Phase III of low rate initial production.

We have a viable, deliberate acquisition strategy for BCIS that has been authorized by the Army Systems Acquisition Review Council and the Milestone Decision Authority and reviewed by the Defense Acquisition Executive. This strategy is to conduct Initial Operational Test and Evaluation (IOTE) this summer based on an updated, approved Operational Requirements Document and Test and Evaluation Master Plan, leverage the results to effect funding in the May 2002 Program Objective Memorandum submit (FY2004-09), and conduct Milestone III June 2002 based on the IOTE and funding. This strategy will enable a competitive acquisition phase for full rate production.

Should you require any additional information, please contact Mr. Chapin Horton at (703) 604-7044 (DSN 664);email: chapin.horton@saalt.army.mil.

ROBERT A. ARMBRUSTER, JR.
Major General, USA
Deputy for Systems Management
and Horizontal Technology Integratic

Enclosure

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Army Comments on the Draft Audit Report of the Acquisition of the Battlefield Combat Identification System (Project No. D2000AE-0210)

1. Finding A--The Army did not have a viable acquisition strategy to acquire BCIS at completion of the engineering and manufacturing development phase: Non-concur.

     a. The Army does have an approved acquisition strategy for BCIS that is balanced, practical, and prudent, considering current funding constraints, the need to validate the reliability of early production BCIS hardware, and the need to assess the system's operational contribution relative to situational awareness (SA). This acquisition strategy, approved by the Army Acquisition Executive (AAE) on 30 July 1999, maps out schedules, contracting plans, testing plans, and milestone decision reviews required to take the BCIS program from engineering and manufacturing development through full rate production and pre-planned product improvement (P3I) phases. Current program funding reflects a deliberate decision by the Army to procure BCIS initially to equip only the First Digitized Division (FDD), 4th Infantry Division at Fort Hood, Texas. On 30 June 1999, the Army Systems Acquisition Review Council (ASARC) reviewed BCIS for low rate initial production (LRIP) and recommended to the milestone decision authority (MDA) a three-phased approach for LRIP to equip the FDD. The resulting Acquisition Decision Memorandum (ADM), approved on 29 July 1999, authorized award of LRIP contracts for Phase I (FY1999) and Phase II (FY2000), but directed that Phase III, FY2001 and beyond, would be contingent upon a successful Headquarters Department of the Army (HQDA) In-Process Review (IPR) chaired by the Military Deputy to Assistant Secretary of the Army for Acquisition, Logistics and Technology (MILDEP ASA (ALT)) in 2001 to verify the following: system performance and reliability; plans for testing and integration of BCIS on host platforms; plans for fielding BCIS with appropriate training and training devices; and quantification of fratricide provided by BCIS above SA. On 7 October 1999, the AAE submitted a memorandum to the Under Secretary of Defense (Acquisition and Technology) explaining the Army's rationale for limiting procurement to the FDD only and why moving forward with LRIP without full rate production funding is the most prudent course of action. The Army is continuing to execute the program authorized by the ASARC and MDA. Final testing of system reliability and Initial Operational Test and Evaluation (IOTE) are to be completed this summer and a production commitment decision is planned for third quarter 2002 that will support a competitive acquisition phase for full rate production. This approach allows us to effect fiscal year 2004 and beyond funding to support a rationalized full rate production program.

     b. In view of the decisions and actions directed by the ASARC and MDA, a delay in implementing Phase III of LRIP was deemed unnecessary. The MILDEP convened the HQDA IPR on 20 February 2001. Based on presentations by the Product Manager for Combat Identification and representatives of the user community, the independent test community, the training community, the program offices for the major platforms that will receive BCIS, and the unanimous recommendation of the HQDA Overarching Integrated Product Team, the MILDEP concluded that the requirements for the IPR had been met and granted approval to implement Phase III, predicated upon completion of the Reliability Development Growth Test (RDGT) currently in process.

2. Finding B--BCIS did not have a current and comprehensive test and evaluation master plan, lacked funding to test 20 operational requirements and did not plan to test production hardware in cold, fog, snow, and rain: Concur with comment:

a. The Army agrees that the approved Test and Evaluation Master Plan (TEMP) on hand at the time of this audit was the 1993 version developed for the BCIS Milestone II Decision Review. The Army also acknowledges that the current TEMP requires updating to incorporate changes in the BCIS program since the Milestone II Decision Review and to comply with policy changes that have occurred. A BCIS Test Working Level Integrated Product Team (WIPT), consisting of testing experts from across the Army's test community, began work in second quarter 1999 to solidify the BCIS test program and update the TEMP. The updated TEMP, now in final staffing, will be completed and approved by the Operational Test Readiness Review in early July 2001, prior to the IOTE scheduled in fourth quarter FY2001. The test program reflected in the updated TEMP will enable the independent tester to address the BCIS operational requirements and render an assessment of the system's suitability, effectiveness and survivability.

b. Concerning the lack of environmental testing, the Army will rely on data from numerous developmental tests performed over the life of the program plus verification of production hardware performance in environmental extremes during the in-plant RDGT, as well as supplemental modeling and simulation.

c. Given the closeness to completion, the Army does not agree that there will be increased risk in producing a system that will not meet the full need of the user due to the lack of an updated TEMP and Operational Requirements Document (ORD). The updated TEMP is well on the way to approval. The Training and Doctrine Command System Manager (TSM) has updated the ORD with approval expected by April 2001. The Army is satisfied that the requirements in the updated ORD and the test program reflected in the updated TEMP will provide the testers an adequate basis for determining whether the production hardware meets the full need of the user. BCIS performance except for reliability has never been an issue; always as good or better than the ORD required. Reliability (mean time between failure) of the stable configuration of BCIS has been proven out in demonstrations and tests, culminating in the RDGT, which ends March 2001.

3. Management Control Program--The management control program did not ensure that Army management periodically reviewed program documents to determine if they were up-to-date and on compliance with Army guidance: The Army is implementing the actions recommended on the audit report. The TRADOC System Manager had previously initiated action to accommodate recommendations by Director for Command, Control, Communications, and Computers (J6) and Director, Defense Information Systems Agency concerning the ORD. Approval of the ORD is expected by April 2001. The Product Manager for Combat Identification had been actively working through the BCIS Test WIPT to update the TEMP to accurately reflect current and future tests and evaluations, resource and schedule activities, and a test management strategy based on the updated ORD. TEMP approval is expected by early July 2001. The Product Manager has put in place measures to strengthen his management control process to

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preclude a repeat of documentation not being flagged in the annual assessment. The Program Executive Officer for Intelligence Electronic Warfare and Sensors was aware of the need for the BCIS ORD and TEMP updates and the status thereof.

4. Summary of Recommendations --Delay Phase III of LRIP until Army provides full funding for production phase of the program: Non-concur. The ASARC and MDA, in approving the BCIS LRIP, took into consideration the risks associated with continuing with Phase III and directed the appropriate management actions to mitigate those risks. Testing necessary to address the requirements for the 20 February 2001 HQDA IPR were completed and produced sufficient data and insights for the MILDEP to make an informed assessment/decision.

5. Additional facts and clarifications, essential for accuracy and contextual correctness. pertaining to the main body of the report:

Page 1,
Revised

     a. Page 1, Background: Recommend lines 14-19 be changed to read as follows to provide a complete and accurate description of BCIS operation: "The BCIS interrogation is triggered automatically by activating the shooter platform's laser range-finder or interrogation button, which sends an encrypted, directional query message to the targeted vehicle. If the targeted vehicle is friendly and equipped with BCIS, its transponder answers with an encrypted, omni-directional friend message. If the BCIS-calculated distance to the target is approximately the same as the distance estimated by the Laser Range Finder (LRF), then a friend light is illuminated in the gunner's sight, supplemented by voice confirmation. If the BCIS-calculated distance is substantially different from the LRF-calculated distance, then the shooter is given friend-at-range visual and audio signals, indicating that a friend is at the range calculated by BCIS, but may not be the target in the gunner's sight."

Page 3,
Revised

     b. Page 3, Paragraph A, Lines 6-7: Recommend the statement " without requiring the Product Manager to obtain full funding for the program "be deleted. Prioritization and funding decisions for Army acquisition programs are under the purview of the Headquarters Department of the Army Staff. The Product Manager has consistently requested full funding for the BCIS program, but full funding has not been approved to date, as discussed in the comments for Finding A.

Page 11

     c. Page 10, Section B, Comprehensive Test Planning Strategy, Paragraph 1 Bullet 1: The Army does not agree that the TSM failed to update the ORD in accordance with new guidance requiring key performance parameters (KPP). The Army issued policy guidance for this requirement effective June 2000. The TSM completed the update of the ORD, to include KPP and cost data, on 26 December 2000. Approval is expected by April 2001.

Page 11

     d. Page 10, Section B, Comprehensive Test Planning Strategy, Paragraph 1, Bullet 2: The Army agrees that the Office of the Joint Chiefs of Staff, Director for Command, Control, Communications and Computers has yet to certify the ORD for interoperability. However, the report should indicate that the updated BCIS ORD includes an interoperability KPP and that the TSM has taken action to achieve the required J6 certification.

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e. Page 10, Section B, Comprehensive Test Planning Strategy, Paragraph 1, Bullet 3: Recommend deletion of the statement that "The BCIS Product Manager did not ensure that planned operational tests addressed all BCIS Operational requirements. Specifically, planned tests did not address requirements for operating in all environments, Service compatibility, system reliability and supportability, platform vulnerability to detection and situational awareness linkage." This statement is inaccurate. The Product Manager for Combat Identification has consistently worked closely with the BCIS testers to ensure a comprehensive operational test. Decisions concerning the scope of operational testing, test methodology and assessment of the results are the responsibility of the U.S. Army Test and Evaluation Command (ATEC), the Army's independent operational test agency. The Army is satisfied that the BCIS test strategy developed by the BCIS Test WIPT will adequately address the concerns noted in the audit report.

Page 11

f. Page 15, Realistic Testing of Operational Requirements, Paragraph 2, Lines 7-10: The Army does not agree with the conclusion that testing will not be representative of the battlefield environment. The Abrams Tank and Bradley Fighting Vehicle, or their variants, constitute the majority of the combat shooter platforms scheduled to be equipped with BCIS. The High Mobility Multipurpose Wheeled Vehicle (HMMWV) and its variants comprise the remainder of the shooter systems and a significant portion of the non-shooter platforms to be BCIS-equipped. Resource constraints, including funding, personnel, equipment, ranges, etc., make it cost prohibitive to operationally test BCIS on every variant of every host platform prior to production.

Page 16

g. Page 16, Platform Vulnerability to Detection: Recommend this paragraph be revised to read "Under the current test strategy, U.S. Army Test and Evaluation Command plans to evaluate the potential increase in BCIS-equipped platforms to detection by enemy sensors. The evaluation will be based on analysis by the Survivability Lethality Analysis Directorate (SLAD) of results from planned vulnerability tests on BCIS in April-May 2001 timeframe, as well as previous test results from earlier version of BCIS that are deemed relevant to the current version.

Page 17, Revised

h. Page 16, Situational Awareness Linkage, Lines 22-27: Recommend this statement be deleted. BCIS interoperability with situational awareness is an objective requirement in the updated ORD and is not an issue for the MILDEP IPR or the Production Decision Review

Page 17, Revised

i. Page 30, Appendix D, BCIS Operational Requirements, Requirement 2: The current BCIS is designed for ground-to-ground, mounted operations only and will be fully tested against that requirement. Dismounted combat identification requirements are being addressed with ICIDS. Rotary wing combat identification requirements are still under study by the user community. Recommend both the Resourced and Operational Test columns be changed to read "Yes."

Page 33

j. Page 30, Appendix D, BCIS Operational Requirements, Requirement 3: Recommend that the Operational Test column be changed to read "Partial". Both IOTE

Page 33

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and the Follow-on Operational Test and Evaluation (FOTE) will test representative and relevant military operations, but no feasible operational test could cover the entire "continuum of military operations."

    k. Page 30, Appendix D, BCIS Operational Requirements, Requirement 5: Recommend the Operational Test column be changed to read "Not Applicable" since the current version of BCIS was never envisioned to be a far-term solution.

    l. Page 31, Appendix D, BCIS Requirements, Requirement 7: Recommend the footnote be revised to read "There are no production combat identification systems from allies available for operational test. However, ATEC plans to use realistic target silhouettes to test whether BCIS will reduce fratricides in coalition warfare, especially involving non-traditional allies who may have equipment usually associated with hostile forces.

    m. Page 32, Appendix D, BCIS Operational Requirements, Requirement 16. Recommend the Operational Test column be changed to read "Yes." The current BCIS configuration is designed to attain a minimum of .90 probability of correct identification for ground-to-ground operations and will be tested to that criterion during IOTE. The objective requirement of .99 probability of correct identification would be operationally tested in a follow-on test if the Army decides to make that requirement part of a BCIS P3 I or block upgrade effort. The part of the requirement relating to dismounted operations, operations involving friendly fixed wing aircraft and the identification of enemy, neutrals and noncombatants does not apply to the current BCIS configuration.

    n. Page 33, Appendix D, BCIS Requirements, Requirement 23: Recommend Resourced, Developmental Test and Operational Test columns be changed to read" Not Applicable" since this requirement applies to the Individual Combat Identification System (ICIDS) program developed under a separate ORD.

    o. Page 34, Appendix D, BCIS Operational Requirements, Requirement 24: Recommend the Resourced, Developmental Test and Operational Test columns be changed to read" Not Applicable" since this requirement applies to the rotary wing-to-ground combat identification mission area and will be addressed when an ORD is developed for that mission area.

    p. Page 35, Appendix D, BCIS Operational Requirements, Requirement 30: Recommend the Resourced, Developmental Test and Operational Test columns be changed to read "Not Applicable" for same reason stated above for requirement 23.

    q. Page 36, Appendix D, BCIS Operational Requirements, Requirement 37: Recommend a footnote be added to the Operational Test column to indicate this is an objective requirement which would be operationally tested in a follow-on test if the Army decides to make that requirement part of a BCIS P3I or block upgrade effort.

    r. Page 37, Appendix D, BCIS Operational Requirements, Requirement 44: Recommend the Operational Test column be changed to read "Yes" and both statements deleted. The reference to Production Verification Test (PVT) under

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Operational Test is inappropriate since PVT is developmental testing, and the comment that indicates RAM will not be collected in IOTE is inaccurate. The Army does plan to collect RAM data during operational test.

    s. Page 38, Appendix D, Footnote 51. Recommend this footnote be revised in accordance with the comments at paragraph 5h, above.

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Audit Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Personnel of the Office of the Inspector General, DoD, who contributed to the report are listed below.

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